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NEWSPAPER

NetworkWorld

February 24, 1997

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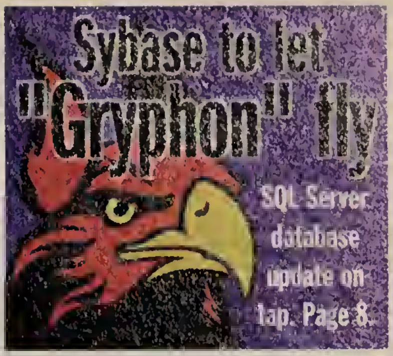
FEBRUARY 24, 1997 VOLUME 14, NUMBER 8

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING


Sybase to let "Gryphon" fly

SQL Server database update on tap. Page 8.

NETWORK COMPUTERS

A LOOK BEHIND THE NUMBERS

By Daniel Dern

If you believe what some research firms say, network computers (NC) will not only be less expensive to buy than desktop PCs, they'll cost significantly less to own and operate. By at least a couple of estimates, the reduction in total cost of ownership (TCO) should hover around $3,000 per year — a significant chunk of change by any measure.

This assumes, of course, you're prepared to believe the numbers analysts are coming up with. We, being skeptical reporter types, were not. So we dug around behind the numbers and came to the firm conclusion that nobody can say with a reasonable degree of accuracy or confidence how much, if anything, an NC might save you. There are too many variables that have yet to be explored and lots of assumptions, omissions and gotchas in the data being bandied about.

Analyst estimates on cost savings are based largely on conjecture and don't tell the whole story.

TROY THOMAS

See Feature, *page 41*

Sun juicing up Java kit

Next-generation Java to be more secure and twice as fast.

By Ellen Messmer and Carol Sliwa

Mountain View, Calif.

Even as it shipped the new Java Developers Kit (JDK) last week, Sun Microsystems, Inc. was hard at work on a revision that could more than double the speed of applet downloads and greatly improve security.

Officials from Sun's JavaSoft subsidiary say the next-generation JDK, an improvement on the 1.1 edition released last week, will be detailed in the Java road map the company will outline at its JavaOne conference in San Francisco this April. JavaSoft hopes to have the JDK update in beta, at least, by year-end.

The revision's main focus will be to improve performance of Java-based Internet and intranet applets and applications, said David Spenhoff, JavaSoft product marketing director. Platform-independent Java code can run six times as slow as platform-dependent code because it has to be interpreted by a Java Virtual Machine (JVM) that runs in browsers and operating systems.

One way in which the company plans to address the speed issue is by taking advantage of new technology from LongView Technologies LLC (conducting business in California as Animorphic Systems), a seven-employee company from Palo Alto, Calif.,

See Java, *page 14*

"This [acquisition of LongView] is related to making Java applets and applications run faster."

David Spenhoff, product marketing manager, JavaSoft

Xylan preps switch splash

By Jodi Cohen

Calabasas, Calif.

Xylan Corp. is readying a LAN switch product blitz that will include an ATM LAN backbone chassis, stand-alone Ethernet/Fast Ethernet workgroup switches and low-end stackable devices.

Cabletron readies new Ethernet/Fast Ethernet SmartSwitch. Page 12.

The switches will significantly broaden Xylan's limited product line that includes the PizzaSwitch stand-alone workgroup Ethernet device and OmniSwitch nine-slot LAN chassis. Partner IBM will resell all of the offerings.

The products — which will be on display at NetWorld+Interop 97 in May — could help Xylan reach big shot status in the switching mart, where it is currently considered a strong but small player.

The highlight of the upcom-

See Xylan, *page 12*

We don't have it down cold yet, but we're getting better.

Log on and check out the newly revamped Network World Fusion Web site. Besides making it easier to find hyperlink resources that back up stories appearing in print, we have made the site easier to navigate and more feature-rich. Give it a whirl at www.nwfusion.com.

Int'l pact may boost telecom services before it lowers prices

By David Rohde

Washington, D.C.

Call it the Telecommunications Act of 1997.

Under intense prodding from the U.S., most of the world's industrialized nations have signed an agreement that aims to spur the availability of advanced network services and lower prices worldwide by wresting control of telecommunications facilities away from government-owned monopolies.

The new World Trade Organization (WTO) telecom services agreement mirrors key aspects of the U.S. Telecommunications Act of 1996 — from network interconnection requirements to authorization for carriers to buy one another. Analysts said the WTO agreement offers exactly the same long-term promise — and immediate implementation headaches — as America's famously troubled telecom reform adventure.

"It remains to be seen whether the countries will really open their markets in accordance with the agreement," said Leonard Elfenbein, chairman of Lynx Technologies, Inc., a Fairfield, N.J., consulting firm and

See Telecom, *page 16*

ManageWise to handle software distribution task

By Christine Burns

Novell, Inc. is prepping an add-on to its ManageWise LAN management package that will enable administrators to distribute applications to client and server machines regardless of their location or operating system.

Code-named ManageWise Distribute, this offering will exploit Novell's enterprise directory services technology to let network managers identify

See ManageWise, *page 16*

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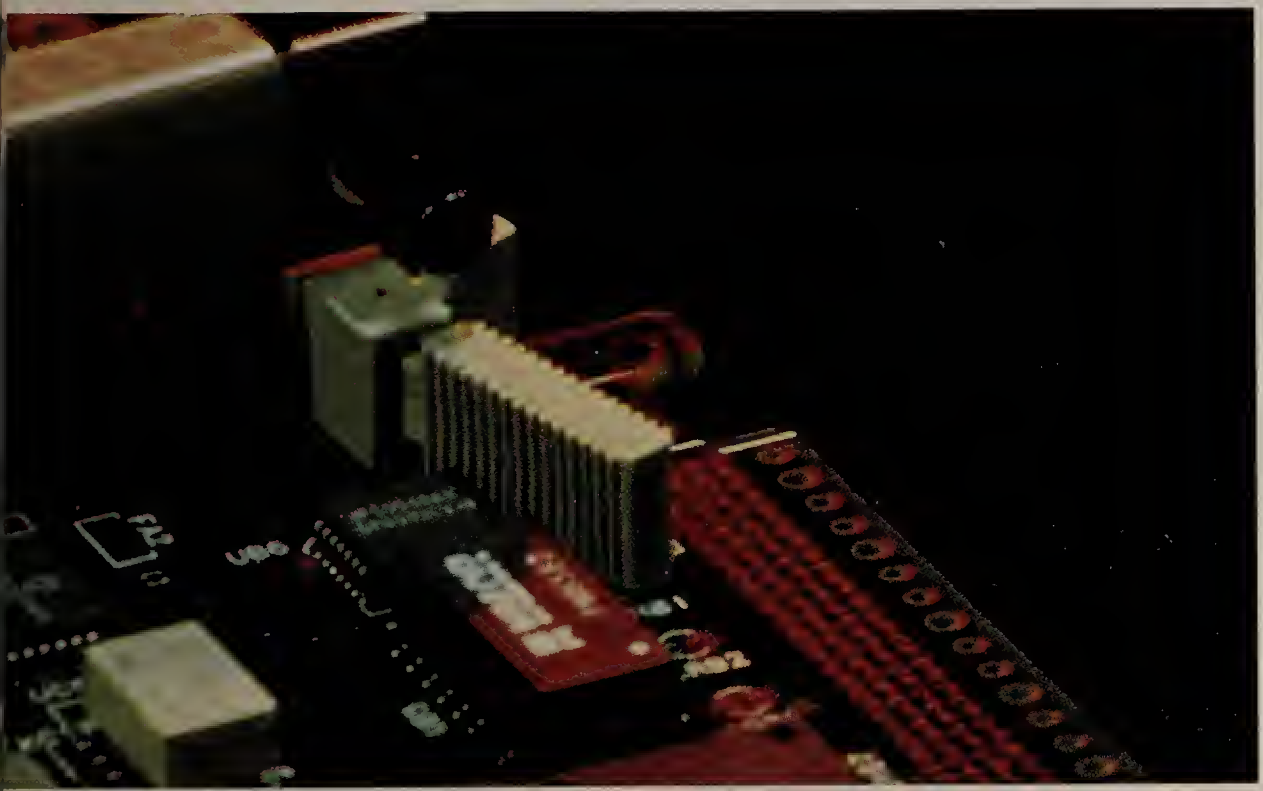

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Let's face facts. A few users simultaneously accessing standard office applications can drain all the bandwidth in a 10 Mbps network. Combine that with today's client/server, Internet access, and imaging applications, and 10 Mbps to the desktop won't hold water for very long.

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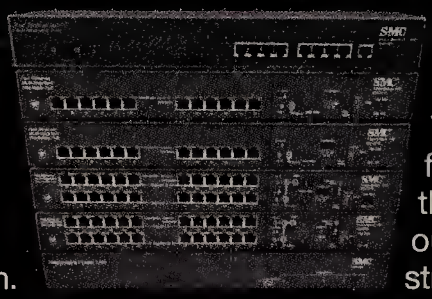

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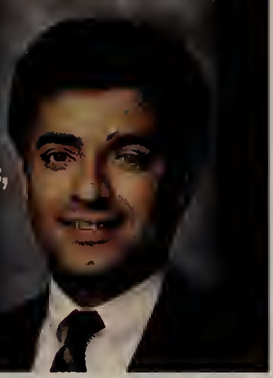
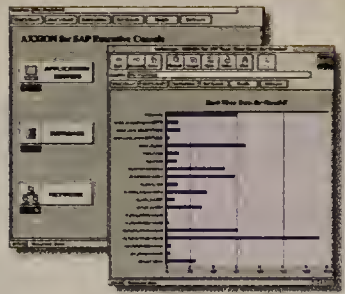


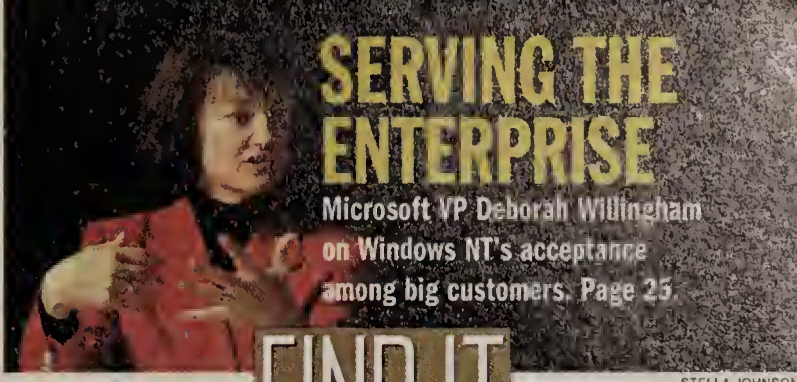
JAVA HEATS UP

Symantec's Alan Bannon just wants to bring Java to the masses. Symantec, though, is just one of many vendors rushing Java application development tools to market. Page 35.

MAKING SAP A SNAP



With Axxion (shown here), OpenVision Technologies wants to ease the pain of managing large SAP R/3 environments. Page 19.



SERVING THE ENTERPRISE

Microsoft VP Deborah Willingham on Windows NT's acceptance among big customers. Page 25.

STELLA JOHNSON

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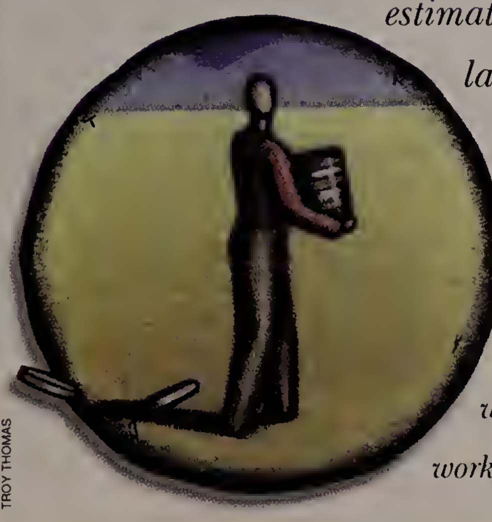

TROY THOMAS

SERVER REVIEW SERIES. *HP and SAG Electronics are first to take on our new enterprise server test, while Dell submits another low-cost workgroup model.* Page 46.

FIND IT ON FUSION

To quickly get to any online info referenced in *Network World,* type its DocFinder number in the input box on the home page.

This Week

We're making Fusion better. Come online to see how much easier the site is to navigate. And check in over the coming weeks for new features and services.

Only on Fusion

- **Careers.** Demand for networking managers is at a record high – especially for those with NT and WAN experience – a job placement firm reports. Read the report and grab a copy of our 1996 survey of networking salaries. **DocFinder: 0833**
- **Telecom reform.** The war of words between IXCs and LECs continued last week, with long-distance carriers forming a committee to monitor how quickly the LECs install the equipment and interfaces needed for local-loop competition. **DocFinder: 0832**

This Week

There are more resources online to accompany the hot news in the current issue of *Network World.*

- **Java.** Download your own copies of the new Java and JavaBeans development kits. Read an expanded version of our report on Java rapid application development (RAD) and see offerings from various Java RAD vendors. **DocFinder: 0831**
- **Telecommunications.** Read an overview from the World Trade Organization on its proposed overhaul of global telecom regulations. **DocFinder: 0834**

Buyer's Guides/Reviews

- **Servers.** Download complete test results from our latest server reviews. **DocFinder: 0824**

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News briefs, February 24, 1997

Cisco standards follow-up

■ Toshiba Corp., one of Cisco Systems, Inc.'s collaborators in forming an Internet Engineering Task Force working group for network layer switching, is confident that Cisco is working on the standard in good faith. Cisco E-mail leaked to *Network World* regarding the group raised questions about Cisco's standard-setting priorities (*NW*, Feb. 17, page 1). "We believe Cisco is an honorable partner in the process," said Ian Mashiter, a spokesman for Toshiba. "I don't think there's anything in that E-mail that Toshiba finds controversial." IBM, another collaborator in the IETF network layer switching effort, declined comment.

Apple reorganizes

■ Apple Computer, Inc. last week stamped approval on restructuring plans, first alluded to in January, consolidating its development, marketing, sales, support and operations divisions into three North American business units. The company said it hopes the geographic restructuring plan will put Apple in closer touch with its customers. The largest group, the North America Business Division, will focus on publishing, engineering, new media, enterprise products and the scientific market. Apple created similar divisions in foreign countries. The reorganization led to the resignation of Marco Landi, former vice president of Apple's worldwide sales and support division, whose role would have been minimized.

Microsoft responds

■ Microsoft Corp. last week announced the launch of a Web Executable Advisor program as a free information resource regarding security threats posed by anonymously authored applications that can be downloaded over the Internet. Users will have access to a regularly updated Web site, mailing lists and other education programs. The program initially can be accessed at www.microsoft.com/security/.

Netscape kills LivePayment

■ Netscape Communications Corp. last week confirmed it has ditched its LivePayment server software due to weak customer response. LivePayment consisted of JavaScript templates that made it easy for Web sites to accept credit card payments. A source said the company is working on deals to turn over the LivePayment software and customers to Cybercash, Inc. and Verifone, Inc. Netscape plans to focus on higher end electronic commerce applications through its Actra Business Systems joint venture with GE Information Services, a Netscape spokeswoman said.

True believer

■ Cardinal Technologies, Inc. not only believes in U.S. Robotics' 56K bit/sec modem technology, but it believes in the company's delivery timetable. Cardinal, which will market U.S. Robotics' x2 modem technology in its Connecta modems, last week said it would ship 56K bit/sec-ready modems March 3. That announcement comes after U.S. Robotics' scheduled release for the technology was delayed from late January to late this month, with no firm date set yet.

Don't count tariffs out just yet

■ A federal appeals court last week stayed the Federal Communications Commission's order forcing long-distance carriers to cancel their tariffs by September. MCI Communications Corp. requested the stay, arguing that the law gives carriers the right to choose whether to cancel tariffs. Since the appeals court will not hear the full case until fall, long-distance tariffs are likely to remain in place at least through year-end. User groups unsuccessfully tried to stop the stay, arguing that tariffs give carriers the ability to manipulate rates in the middle of a long-term contract.

Ascend gobbles up Whitetree for $70m

Also, PairGain announces its purchase of ATM specialist Avidia Systems for $94 million.

By Tim Greene

Ascend Communications, Inc. last week announced plans to buy LAN switching specialist Whitetree, Inc. to gain the missing component it needs to compete against Cisco Systems, Inc. for all aspects of the Internet service provider market.

While Ascend already had a high-density access multiplexer in its Max TNT and a gigabit router in its GRF, the company lacked the switching to tie the two together.

Whitetree's WS3000 Ethernet/ATM switch fills that gap, according to Joe Noel, an analyst with Hambrecht & Quist in San Francisco. "With Whitetree, they can provide everything an ISP needs. The [ISP] doesn't have to go to Cisco," Noel said.

The deal, worth about $70 million, is expected to close in April.

Bernie Schneider, Ascend's vice president of business development, said his company was particularly interested in Whitetree's ATM expertise and its ongoing work with Texas Instruments, Inc. to develop gigabit-speed Application Specific Integrated Circuits.

"As things get faster and the scales get larger, we're going to need those speeds," Schneider said. In the short term, he said Ascend would use Whitetree technology to add faster ports and different protocol support to existing Ascend products.

Cisco routers and Catalyst switches are a mainstay of many ISPs, Noel said. But with Ascend's Max access products also a standard ISP fixture, the company is trying to push further into the ISP networks.

Ascend made the initial thrust last year when it took on Cisco routers with GRF, which it obtained via the acquisition of NetStar, Inc. (*NW*, Sept. 9, 1996, page 10).

ASCEND BUYS WHITETREE

Company:	Whitetree, Inc.
Based:	Palo Alto, Calif.
Founded:	1993
Purchase price:	About $70 million in stock
Employees:	70
Products:	WS3000 and WS2500 Ethernet/ATM workgroup switches
1996 revenue:	$10 million-$15 million

PairGain makes a buy

In related news, PairGain Technologies, Inc. announced the purchase of Avidia Systems, Inc., specialists in low-cost ATM workgroup and LAN switches, for $94 million.

The acquisition will enable PairGain's Digital Subscriber Line (DSL) gear to support ATM. Already a big player in the High-bit-rate DSL market, the company recently announced its first Asymmetric DSL modems and multiplexers.

Those products support Ethernet transport, but carriers that will offer DSL service want either ATM or frame relay traffic to ride over the DSL lines. That will make it easier to manage the traffic within their networks, according to Christine Heckart, director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J.

PairGain expects to release the first product from the acquisition about midyear, and an entire DSL system — from user PC card to carrier multiplexers — by the end of the year. ■

Bay secures remote access

By Jim Duffy
Billerica, Mass.

Bay Networks, Inc. last week unveiled remote access software designed to secure user access to corporate nets.

Bay's BayStream Dial VPN Services software, targeted at users that are outsourcing remote access requirements to carriers and Internet service providers, runs on Bay's 5000 Multi-Service Access Switch and Remote Annex remote access concentrators, as well as its Backbone Node (BN) routers.

The software makes it possible to provide secure access to corporate nets for users dialing in to the network cloud over analog or ISDN lines. When calls from remote users enter the carrier point of presence over those lines, they are encapsulated in IP, aggregated and delivered to the corporate net over a frame relay permanent virtual circuit (PVC), said Brian Walck, Bay's director of strategic development and planning for multiservice infrastructure.

The software uses the Layer 3-based Mobile IP protocol to dynamically set up and tear down secure IP tunnels between the dial-in user and the corporate net. The BayStream offering includes Unix-based software, called Tunnel Manager, that maps the IP tunnel to the appropriate frame relay PVC.

A Bay BN router aggregates the traffic and funnels it onto a frame relay PVC. The gateway BN also serves as a Remote Authentication Dial-in User Service-compliant proxy, ensuring that only authorized devices gain access to the gateway and corporate net.

By authenticating access at the central office, users can maintain their own authentication, authorization, IP address assignment and firewall policies without change, Walck said.

Bay's competitors in the dial virtual private network market include Ascend Communications, Inc., Cisco Systems, Inc. and U.S. Robotics, Walck said. Offerings from those firms, though, require users to change their existing security policies, he claimed.

Analysts say Bay's offering may be unique.

"I'm not aware of anybody who's actually doing this from a service provider aspect yet, in this particular way, for dial-up," said Rosemary Cochran, an analyst at Vertical Systems Group in Dedham, Mass.

BayStream Dial VPN Service is offered in Bay's BayStream Remote Access Software 4.2, which costs from $2,500 to $10,000 and is available now.

☎Bay: (508) 670-8888.

BayStream Dial VPN Services

- ● Eliminate the need to install, expand or support a remote access infrastructure
- ● Provide one-stop shopping for Internet access, remote LAN access and wide-area interconnection of corporate locations
- ● Enhance security by maintaining address and user authentication integrity, and avoiding changes to firewalls

Some people find editorial comment more credible than advertising copy.

Cool.

PC World said, "The (IBM) Network Printer 12's \$1250* street price is the lowest on the monochrome chart, and its two-pages-per-minute graphics speed is one of the fastest." (January 1997)

Computer Shopper said, "IBM has come up with a winning combination for medium-size networks... that need reliable, fast printing.... Installation of the Network Printer 17 on our Ethernet network was one of the quickest and easiest we've ever performed." (December 1996)

PC Magazine said, "The IBM Network Color Printer will satisfy the needs of both business users who need simple color output for reports and presentations and desktop publishers who want nearly photographic-quality output." (October 1996)

IBM Printing Systems Company says, "Call us now at 1 800 358-6661, choose the 'Printer Selection Center' option, and find out more about the network printers lots of people are talking about." If you'd like to read the reviews mentioned here, visit us at www.can.ibm.com/ibmprinters

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Sybase looks to battle back with new database

By John Cox
Emeryville, Calif.

Sybase, Inc. is betting on new database and middleware products, both targeted at Internet/Web applications, to catapult it back into the front rank of database vendors.

The products — set to enter beta testing in the next few weeks — include Gryphon, the next release of the SQL Server database, and Jaguar, a transaction server that will link clients with back-end data sources. By combining the two, users will be able to build applications that can cope with fast-changing Internet traffic loads and pull together transaction processing and query processing to satisfy a single Web client request, Sybase executives said.

Gryphon is an attempt to add major functions that are ideally suited for the burgeoning Internet/Web market, according to Michael Regan, vice president of the Server Products Group. New functions include the ability to perform parallel operations and handle speciality data types or mixed workloads.

The ability to run tasks such as loading data and creating indices in parallel, and doing this on big multiprocessor servers means Gryphon will deliver much better performance than SQL Server 11 for very large databases.

It also means Gryphon will be able to cope with the unpredictable, and potentially huge, traffic volumes of some Internet applications.

"I'm excited about the approach," said Bill Niemi, principal technology consultant with Fidelity Investment Corp.'s administrative investment systems group. "They need to be in a position where they can compete with Informix Software, Inc.'s parallel database support and Oracle Corp.'s cluster support."

Sybase has trailed badly behind both rivals in parallel support for some time.

Sybase has also lagged in equipping its database to handle data types other than numbers and letters, such as images and text. According to Regan, a component of Gryphon, called Adaptive Server, will handle such specialty data types in a couple of ways.

First, the adaptive server will act like a switch, sending an application query to a third-party product, such as a high-performance image server. Gryphon will take the results of that server's processing, combine it with its own relational query results, and deliver a response to the applications.

"It will be a seamless pass-through," Regan promised.

Second, Gryphon will incorporate, via a new "snap-in" architecture, technology licensed from a few third-party vendors for selected data types. For example, Verity, Inc.'s Topic text processing technology is being included in Gryphon.

Regan said details of the architecture will be revealed at the annual meeting of Sybase users in April. Gryphon and Jaguar are expected to be in beta by then.

In addition, Gryphon will include "application queues," which will enable the database to set priorities about when, how and in what order to process a mix of requests — transactions, decision-support queries and Web-based requests that combine both. Internet transactions are characterized by this mixed workload, according to Regan.

Gryphon will be part of a tight package with Jaguar, the company's new Internet transaction server, according to David Hsieh, vice president of marketing for Sybase's middleware and data warehousing division. Jaguar will combine features of an object request broker, Web server APIs, the Common Gateway Interface and a transaction processing monitor. ■

SYBASE PRODUCTS ON TAP

Gryphon SQL Server database update will include:

- Parallel loading, indexing and querying
- Adaptive server architecture for handling non-relational data types such as text and images
- The ability to coordinate mixed workloads, such as transaction processing and query handling, across servers

Jaguar Internet transaction server will include:

- Middle-tier server software for executing transactions
- The ability to execute business logic written in various languages or component models
- Support for multiple data sources and network protocols

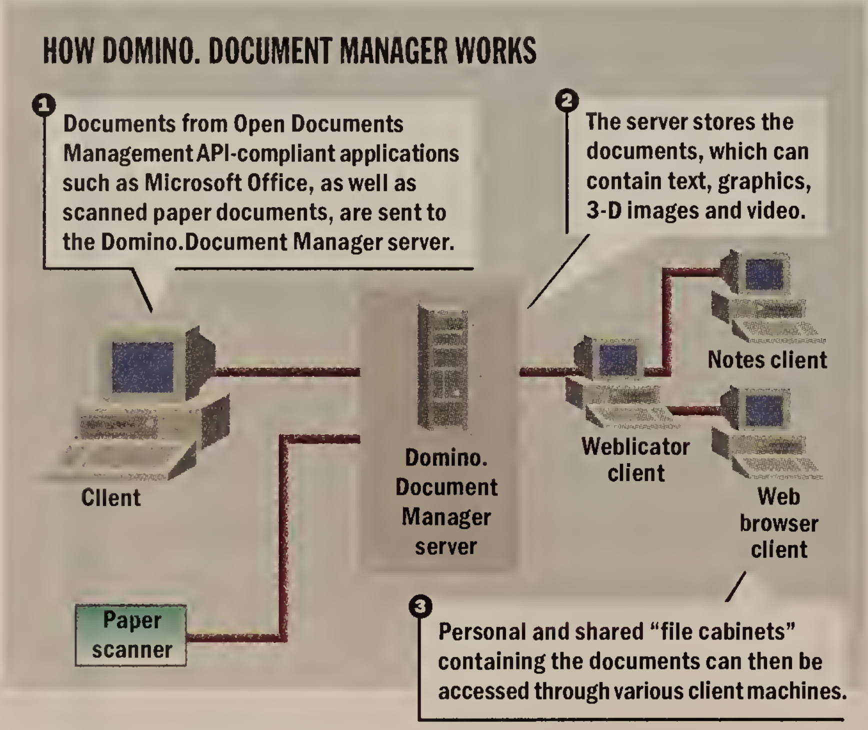
Lotus gets its documents in a row

Company's Domino.Document Manager application garners solid reviews.

By Paul McNamara
Cambridge, Mass.

Having long been skewered for shortchanging document management, Lotus Development Corp. this week is taking the wraps off a product it believes will dispel that rap.

HOW DOMINO. DOCUMENT MANAGER WORKS


❶ Documents from Open Documents Management API-compliant applications such as Microsoft Office, as well as scanned paper documents, are sent to the Domino.Document Manager server.
❷ The server stores the documents, which can contain text, graphics, 3-D images and video.
Client
Domino. Document Manager server
Notes client
Weblicator client
Web browser client
Paper scanner
❸ Personal and shared "file cabinets" containing the documents can then be accessed through various client machines.

Lotus' new Domino.Document Manager, an inexpensive, client/server content management application, allows end users to author, review, collaborate on and distribute a host of different document types.

Industry analysts and customers see Lotus' entry as a potential winner, especially in existing Notes shops. However, they stop short of predicting dire consequences for traditional document management stalwarts such as PC DOCS, Inc., Documentum, Inc. and FileNet Corp.'s Saros division.

"Frankly, we were getting tired of all the analysts beating us up all the time [saying], 'You don't do document management,' " said Timothy Kounadis, marketing manager for Lotus Business Multimedia Products.

Perched atop Lotus' Domino Server, Document Manager allows network users to create "file cabinets" capable of holding text, 3-D images, audio and video. Access and editing rights are assigned by the author to collaborators via E-mail. When the document is complete, it can be E-mailed to a wider audience for review.

Domino.Document Manager lets users store content on a Domino Server as database files. Documents may be authored individually or collaboratively using Open Document Management Application-compliant applications such as Lotus Notes, Microsoft Corp.'s Microsoft Office and Corel Office from Corel Corp. Paper documents may also be scanned into the system.

Initial reviews are positive.

"They're coming into this market pretty much from a standing start, and they've done a good job in providing good, basic document management capabilities," said Ian Campbell, an analyst at International Data Corp. in Framingham, Mass.

An important sales tool

Henry Crespo, corporate manager for sales systems at The Torrington Co. in Torrington, Conn., said he envisions Domino.Document Manager becoming an important tool for his far-flung team of 130 salespeople.

"No. 1, it integrates with my total Notes strategy; and No. 2, it gives me the Internet capability," Crespo said.

Domino.Document Manager, expected to be in beta by early March and shipped to customers April 15, costs $4,275 per server. Notes clients and Web browsers may interact with Document Manager for no additional charge, although the Open Document Managements API integration component for browser users is $29 each.

✆Lotus: (617) 577-8500.

CORRECTION

In the Feb. 17 *Network World* story "Smith Barney sold on using IP video," the implementation schedule in the last paragraph was incorrect. Rollout of the StarCast video multicast system is expected to begin in the fourth quarter, with the project to be completed sometime in 1998.

NETWORK WORLD'S 1996 USER EXCELLENCE AWARD WINNERS

Eli Lilly's Dave Crumbacher and Bear, Stearns' Jeff Marshall accepted *Network World's* 1996 User Excellence awards from Editor in Chief John Gallant earlier this month at the ComNet show in Washington, D.C. The awards go to organizations that best demonstrate how network technology has given them a competitive edge. Eli Lilly proved the power of the intranet with ELVIS, the Eli Lilly Virtual Information System, while Bear, Stearns focused on virtual LANs to boost network performance and improve backup facilities.

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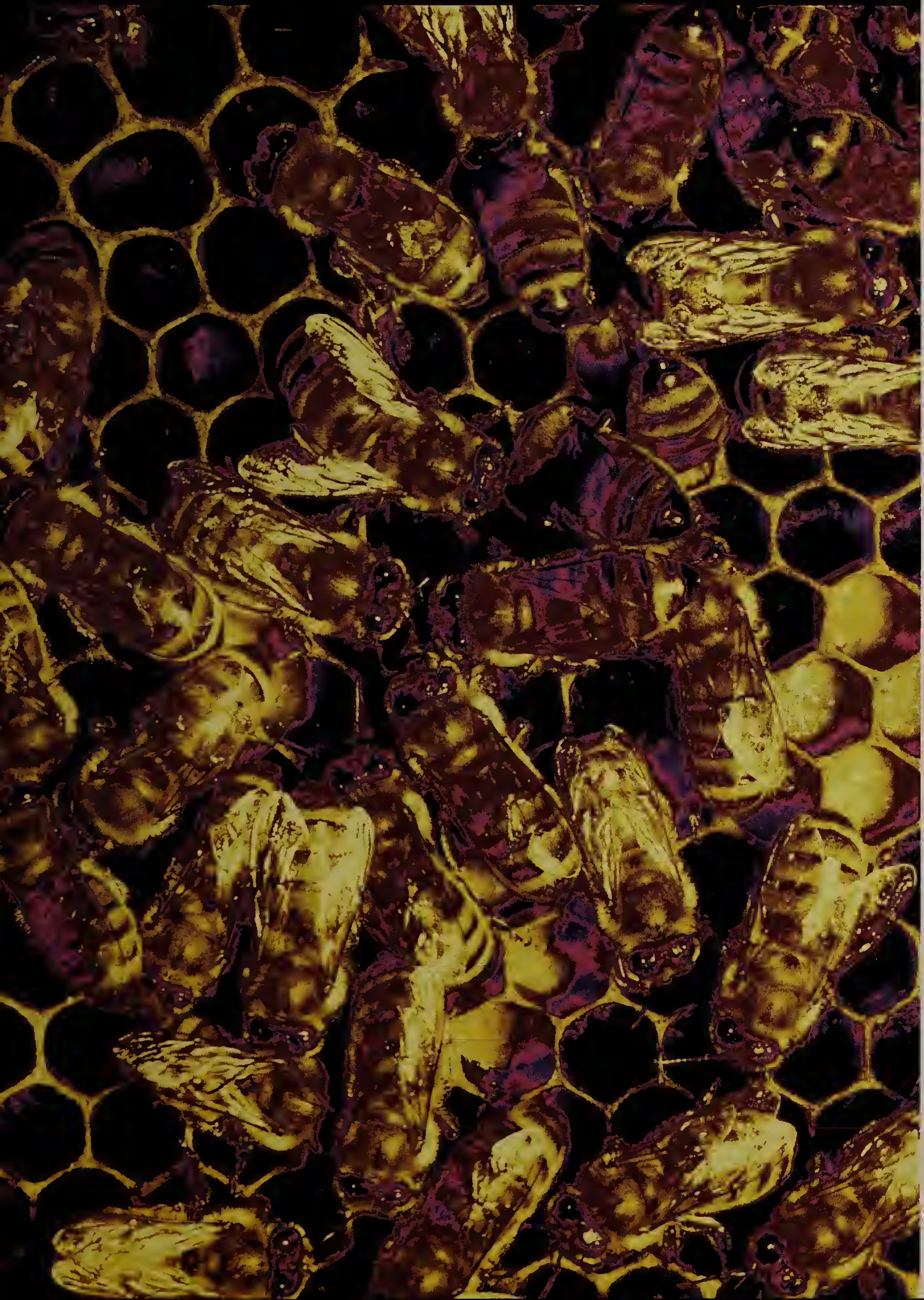

Microsoft to dip into routing market

Software — code-named Steelhead — adds routing capabilities to Windows NT Server.

By Christine Burns

Redmond, Wash.

Despite the fact that Microsoft Corp. is plotting its foray into the router market, Cisco Systems, Inc. shouldn't have too much to worry about.

Microsoft this summer plans to deliver a Windows NT Server add-on — code-named Steelhead — so servers can manage traffic entering and leaving LANs. While the software will essentially turn servers into low-end routers or remote access devices, it is not designed to displace big Cisco backbone routers, said Lloyd Spencer, Microsoft's group product manager for Windows NT Server.

Steelhead will initially support a handful of standard protocols, such as Routing Information Protocol, Open Shortest Path First for interoperability with Cisco routers, Dynamic Host Configuration Protocol for managing IP addresses, and Service Advertisement Protocol, which is used in all Novell, Inc.-based IPX networks.

Eventually, Spencer said, Steelhead could support ATM networking; Layer 2 Tunneling Protocol for dial-up connections to virtual private networks; and Resource Reservation Protocol.

Along with the new routing features will be NT Server's ability to use the Point-to-Point Tunneling Protocol (PPTP) to establish secure server-to-server links over wide-area public network links. Currently, PPTP can only be used for secure links between clients and servers.

The software will work on current NT 4.0 servers, as well as NT 5.0 machines when the operating system upgrade ships.

CLOSER TO CAIRO

Microsoft is steadily unveiling new Windows NT services that will be in the product's 5.0 release — sometimes called Cairo — later this year.

Feature	Runs only on NT 5.0	Runs on NT 4.0 and 5.0
Active Directory Service	☑	
Distributed File System		☑
Kerberos authentication security	☑	
Microsoft Management Console	☑	
Steelhead routing services		☑

Users remain wary

Existing Windows NT Server users, raising concerns about performance and remote controllability of the NT-based routers, gave Steelhead a lukewarm reception.

Rick Shope, manager of PC technology and planning at NationsBanc-CRT Chicago, opted out of testing the Steelhead beta because it did not fit with the bank's strategic direction. The company currently employs routers from 3Com Corp., Bay Networks, Inc. and Cisco.

"We find that doubling up the functions of one machine like that makes it hard to troubleshoot problems. Plus, there is always a hit in performance," he said.

Some observers doubt Microsoft will make much routing headway in smaller firms, either.

"It's as much emotional as it is technical," said Bruce Bancroft, vice president of operations at Trellis Network Services, Inc., a systems integrator in Princeton, N.J. "They are already going with NT on their servers and Windows at the desktop. Now with Microsoft pushing for router control, those users are stepping back and reevaluating just how much of their networks Microsoft should own." ■

IBM joins with FTP Software to boost TCP/IP wares

By Michael Cooney

Research Triangle Park, N.C.

Microsoft Corp. Windows and remote users will benefit most from moves IBM made last week to bolster its family of TCP/IP software.

The company announced a codevelopment agreement with FTP Software, Inc. to incorporate FTP's established client/server-based TCP/IP technology in a range of IBM software packages. The idea is to bring enhanced security, reliability and manageability to users deploying IBM TCP/IP software.

"The need for TCP/IP connectivity is exploding, with some additional 20 million new corporate users expected by 2001," said Glenn Hazard, FTP president and chief executive officer. "It is our strategy, in combination with IBM, to help users link existing enterprise networks with emerging intranets."

While company executives were not specific about where FTP's software would be deployed, IBM has no TCP/IP offerings in the Microsoft Windows or NT client/server space where FTP already has products. Observers said that is where new IBM products would show up first.

"We are looking to help users more easily deploy, manage and secure IP networks, and we want to work with IBM to achieve that goal."

Glenn Hazard, president and CEO, FTP Software

"No doubt, that's where FTP's expertise is, and IBM will exploit that quickly," said Lucinda Santisario-Borovick, research manager of computer networking architectures with the International Data Corp. in Framingham, Mass.

IBM does have TCP/IP software for its OS/2 server, OS/400 mid-range and OS/390 mainframe operating systems.

Al Zollar, general manager of IBM's Networking Software group, said, "We can inject the FTP technology into any platform we deem appropriate, and we expect to do that across our platforms."

Products from the joint IBM-FTP agreement could be announced by midyear, Zollar said.

In related news, IBM expanded its ARTour family of wireless products with new TCP/IP gateway and client packages and Web access software, all designed to give remote users access to the Internet and corporate intranets.

The gateway and client software will let remote users dial in to corporate TCP/IP-based applications.

The gateway runs on a local AIX-based server and provides wireless access for remote Windows- or OS/2-based ARTour clients.

In addition, IBM announced ARTour Web Express, which allow ARTour users running any industry-standard browser to access Internet Web applications.

The ARTour gateway and Web Express products will be available this month.

The ARTour gateway will sell for $15,000, with individual clients costing $140.

Web Express will cost $4,000 for each server and $140 per client.

©IBM: (800)426-4968.

HP to acquire Symantec net management tools

By Jim Duffy

Palo Alto, Calif.

In an effort to bolster its PC management offerings, Hewlett-Packard Co. last week said it plans to purchase Symantec Corp.'s network and systems management assets for no more than $30 million.

Symantec makes Norton Administrator Suite for Windows NT, which includes the Norton Administrator for Networks, Expose server management tool and Norton Desktop Administrator. These products provide software distribution, hardware and software inventory, license metering and configuration management for Windows NT, Banyan Systems, Inc. VINES and Novell, Inc. NetWare clients and servers.

HP will add these products to its OpenView systems and network management portfolio. The company claims there is little overlap between the Symantec offerings and its OpenView lineup, even though HP's Professional Suite, Software Distributor and IT/Administration products already incorporate Symantec technology.

Professional Suite is a management offering for small to midsize networks, while Software Distributor disperses software updates to NT, NetWare and Unix clients. IT/Administration provides configuration management and change management of distributed systems.

HP and Symantec have had a marketing alliance since 1994.

"Now we just own more of the technology as opposed to OEMing it," said Becky Hennig, HP product-line marketing manager. HP might have to resolve some product packaging issues down the road though, she acknowledged.

Analysts said the acquisition gives HP instant credibility in the PC management space, especially in Windows NT environments.

What HP gets

Key products from the Symantec deal:

- **Norton Administrator for Networks** — Provides software distribution, hardware and software inventory, and software license metering across heterogeneous desktop environments
- **Expose** — Server management software for Windows NT, VINES and NetWare servers
- **Norton Desktop Administrator** — A desktop configuration and troubleshooting tool

"HP is one of the leading business PC vendors in the world," said Rick Villars, director of network software research at International Data Corp. in Framingham, Mass.

"It was a little strange that, up until this point, HP really didn't have a PC-based management story to sell," Villars said. "They want to take the quick jump and get in as a leader in NT-based systems management vs. [IBM subsidiary] Tivoli and [Computer Associates International, Inc.], even potentially Microsoft."

Symantec products will be offered under the HP OpenView name in the second half of this year. Customers with active Symantec upgrade insurance will be upgraded automatically to the HP OpenView versions of the Symantec products.

The proposed acquisition is expected to be completed this spring. ■

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Netscape offers up more betas

By Carol Sliwa
Mountain View, Calif.

Netscape Communications Corp.'s SuiteSpot 3.0 server and Communicator groupware client offering will be complete — at least in test form — with two beta releases set for today.

Prior to this week, Messaging Server 3.0 was the only missing piece from the SuiteSpot server application package announced last October at Netscape's biannual developers' conference.

The Professional Edition of Communicator, which features calendaring and a 3270 terminal emulator, was the missing element on the client side. Also today, Netscape made a cross-platform standard edition of its Communicator client, dubbed Preview Release 2, available for download from its Web site. The first preview release hit the Web on Dec. 23, 1996, but only for the Windows 95 and NT platforms.

"This is a very significant milestone for us," said Ben Horowitz, Netscape's director of product marketing for messaging and collaboration servers. "With the combination of SuiteSpot 3.0 and Communicator, we feel from a feature standpoint we can compete with any of the proprietary mail systems."

Messaging Server 3.0 and both versions of Communicator are scheduled for general availability in the second quarter.

But users can get a real taste for Messaging Server now since Version 3.0's beta is feature-complete. Features include support for Simple Mail Transfer Protocol, SNMP,Post Office Protocol 3, Lightweight Directory Access Protocol, Internet Message Access Protocol 4, X.509 Version 3.0 digital certificates, a single-copy message store and delivery status notification capability.

The messaging server beta is currently available only on the Solaris platform. The beta for Windows NT and Unix is expected to follow in six weeks, Horowitz said.

To help customers switch from their current mail systems, Netscape has a migration tool kit in beta that can assist with conversions from Lotus Development Corp.'s cc:Mail, Microsoft Corp.'s Mail and Qualcomm, Inc.'s Eudora mail client.

Of Netscape's nine SuiteSpot 3.0 components, only three (Collabra 3.0, Enterprise 3.0 and Messaging 3.0) remain in beta.

But Horowitz said the firm is not looking to sign up large numbers. "It's a small, controlled, targeted program," he said. ■

WorldCom puts up $300m for Internet backbone upgrade

By Denise Pappalardo
Fairfax, Va.

WorldCom, Inc. last week said it is devoting $300 million to upgrade its recently acquired UUNET Technologies Internet backbone, an aggressive effort designed to eliminate future traffic congestion.

By July, UUNET plans to deploy 50 to 70 FORE Systems, Inc. ASX 200 and ASX 1000 ATM backbone switches throughout its nationwide network. The deployment, which is already under way, will significantly change the complexion of UUNET's backbone from being based on 45M bit/sec frame relay links to 622M bit/sec ATM links, said Alan Taffel, UUNET's vice president of marketing and business development (*NW*, Jan. 27, page 6).

Taffel says, *"This network expansion puts us in an entirely different league than our competition."*

In addition to beefing up its backbone, UUNET is increasing its dial-up modem support with Ascend Communications, Inc. Max TNT remote access concentrators. The TNTs will increase the Internet service provider's dial access ports to the "hundreds of thousands," Taffel said.

Although most of UUNET's business customers have dedicated access to the ISP's network, Taffel said the dial access increase was necessary for UUNET's virtual ISP customers, such as GTE Corp. and the Microsoft Network. "Dial access demand is growing by 10% every week," he said.

The fact that UUNET is a facilities-based ISP gives it an advantage over competitors such as PSINet, Inc. and Netcom On-Line Communications Services, Inc. when it comes to upgrading its network capacity, said Joel Maloff, president of the Maloff Co., a Dexter, Mich.-based consulting firm.

Facilities-based providers can upgrade their network capacity when they see fit, while others are more at the mercy of the companies from which they lease their capacity, he said.

"OC-12 is very expensive to deploy, so providers are reluctant to make the investment," Maloff said.

MCI Communications Corp. may be the only other provider with OC-12 links in its Internet network. But while MCI has the ability to deploy a full 622M bit/sec backbone, the carrier's investment has been small compared to UUNET's, Maloff said. "MCI has OC-12 segments, but not a comprehensive backbone," he said. ■

Xylan

Continued from page 1

ing announcement will be Xylan's OmniCell ATM switch, which will compete head-on with FORE Systems, Inc.'s ASX-1000 10G bit/sec ATM switch.

OmniCell, which has a backplane capacity of 13.2G bit/sec, is Xylan's first full-blown ATM box. It will support as many as 64 155M bit/sec and 16 622M bit/sec ATM ports. The product will also support Ethernet, Fast Ethernet and FDDI interfaces, as well as some WAN links.

As far as features go, Xylan's OmniCell will offer input port buffering and will support a hardware engine for Layer 3 routing. In fact, all of Xylan's products provide routing functions and sophisticated virtual LAN capabilities, sources said.

The OmniCell chassis — which has eight slots for switch modules and one for a net management module — would sit at the network core. The OmniSwitch frame/cell chassis would feed into the OmniCell, with smaller stand-alone devices fanning out from the OmniSwitch.

While the OmniCell chassis may seem similar to the OmniSwitch device, the ATM box will actually look quite different. For example, the slots will be wider in the OmniCell to support higher density cards. Also, the power supplies will be on the bottom of the box, not on the side as in the OmniSwitch. As for backward compatability, the LAN modules for the OmniSwitch will work in the OmniCell chassis, but not vice versa, sources said.

Xylan stands alone

The new stand-alone devices, called 10/100 PizzaSwitch, are expected to support between 12 and 36 Ethernet/Fast Ethernet ports, each of which can autonegotiate between the two speeds. The switches, which will be offered in a few different configurations, are designed to sit in workgroups or small wiring closets. The boxes could feed into larger LAN backbone switches with 155M or 622M bit/sec ATM, FDDI or frame relay uplinks. Also, Xylan will support Gigabit Ethernet uplinks by year-end.

The dual-speed switches build on Xylan's Ethernet/Fast Ethernet modules for its OmniSwitch chassis. However, the company has no plans to develop a 10M/100M bit/sec Ethernet module that slides into the OmniSwitch.

That disappoints Roger Gross, director of IS for the Carolina Panthers football organization in Charlotte, N.C., who uses Xylan's OmniSwitch at Ericsson Stadium.

"We'd be more inclined to use a module for those chassis than a separate box," he said. "We'll be running some desktop video applications over the network in the next 12 to 14 months, so I could see us needing 10/100M bit/sec Ethernet switching in the chassis."

But Michael Schilling, director of technology at the University of California at Los Angeles Business Enterprises Group, sees the need for stand-alone 10M/100M bit/sec Ethernet switches.

"We have two hotels on campus — each with about a dozen nodes — that need to be transitioned from shared-media hubs to a switched network environment," Schilling said. "But if we put a full chassis in there, we might end up spending $25,000. We're clearly looking for some cheaper alternatives — like a stand-alone switch — for small workgroup areas."

In addition to the stand-alone boxes, Xylan is expected to announce a family of stackable Ethernet switches. Called PizzaStack, the products will round out Xylan's product line with its first low-end switches.

Pricing for all switches has not yet been set. The devices are expected to ship next month.

©Xylan: (818) 880-3500.

Cabletron packs power into switch

Cabletron Systems, Inc. this week will roll out an Ethernet/Fast Ethernet stand-alone switch that offers 58% more Ethernet ports and almost twice the performance of an existing model but costs half as much. In addition, the company will roll out a new five-slot chassis that will provide Ethernet and Fast Ethernet links for the wiring closet.

The SmartSwitch 2200 — part of a new family of SmartSwitch 10M/100M bit/sec Ethernet departmental switches — combines 24 Ethernet ports with two Fast Ethernet uplinks for server or backbone connections. The store-and-forward switch, which is designed to sit in the wiring closet, boasts a forwarding rate of about 450,000 packet/sec.

Cabletron's existing Tsunami switch, which shipped last summer, is a 14-port Ethernet device, with two Fast Ethernet uplinks, that operates at 250,000 packet/sec and sells for $500 per port.

While Cabletron will not discontinue the Tsunami, the product probably will be phased out over time by customer demand for the newer box, industry observers said.

The SmartSwitch 6000 — which will compete with Cisco Systems, Inc.'s Catalyst 5000 — supports as many as 120 Ethernet ports and 10 Fast Ethernet uplinks.

The new SmartSwitch devices support all nine Remote Monitoring groups for collecting per-port statistics on Ethernet segments and will support Cabletron's SecureFast Virtual Networking capabilities, including embedded virtual routing, distributed switching and policy-based management features such as call accounting.

Both switches can be managed via Cabletron's Spectrum net management application or any other SNMP-based platform.

Both devices will be available next month. The 2200 is priced at $250 per port, and pricing was unavailable for the 6000.

For more information, call Cabletron at (603) 332-9400.

—*Jodi Cohen*

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Study finds revised HTTP could help unclog the 'Net

By Todd Wallack

Planned changes to HTTP and other Internet protocols could dramatically reduce congestion on the World-Wide Web, a new study suggests.

Researchers at the World Wide Web Consortium (W3C) said they were able to download a graphics-intensive Web page between two and eight times faster using HTTP 1.1 instead of the current version, HTTP 1.0. They also found "style sheets," which specify the layout of Web documents, and data compression can speed downloads.

"This should provide some breathing room," said Rob Raisch of Internet Co., an Internet consulting firm in Cambridge, Mass. "But it's not a magic bullet. The magic bullet is building more bandwidth."

Jim Gettys, who co-authored the study, said HTTP 1.1 is more efficient than 1.0 because it lets users download multiple files from a server with a single connection.

Under HTTP 1.0, browsers must typically establish different connections to download the text and each graphical image on a Web page, which increases the number of packets clogging the 'Net and defeats algorithms that can ease traffic flow on longer connections.

Both Microsoft Corp. and Netscape Communications Corp. plan to incorporate HTTP 1.1 into future versions of their browsers. Neither company was able to provide more specific dates on short notice.

Gettys said network managers with high-speed Internet connections should be impacted the most simply because of the vast number of packets their connections can generate. By contrast, end users relying on dial-up lines might only see a 20% improvement.

"We aren't trying to oversell this," he said. "Most people are not going to notice very much difference . . . and there are some [secondary effects] that we can't measure."

Gettys said calculating the difference is particularly tricky because the Internet is dynamic — with loads constantly in flux — and networks vary so widely.

"It's a complicated equation," he said. Users must "pipeline" their data, for instance, allowing their computers to request multiple pieces of information simultaneously, to enjoy the full benefits of the protocol.

Raisch warned that the study likely exaggerates the gains. Some Web sites, for example, use graphics stored on more than one server. This means browsers using HTTP 1.1 would still have to make multiple connections to download all the elements. But Gettys contends that is relatively rare.

In any case, the W3C researchers found that style sheets, which provide a standardized way of laying out Web pages and fonts, should significantly cut down on data traffic by eliminating the need to send special graphics for each font. So far, however, only Microsoft's Internet Explorer browser supports the W3C style sheet specification.

The researchers also confirmed that compression techniques should also allow users to trade files with fewer packets. In the trials, they were able to compress the body of an HTTP file by more than a factor of three, and reduced the number of packets by between 14% and 17%, with a freely available C-based code.

One thing that likely will not make much difference is a new graphics format, dubbed PNG, that uses a different compression algorithm than the more widely used GIF and JPEG formats. Gettys said the compression only makes a significant difference with very large graphics. ■

DOWNLOADING WEB PAGES FASTER AND FASTER

	First-time		Verifying cached pages	
Protocol	**Packets**	**Time** (in sec.)	**Packets**	**Time** (in sec.)
HTTP 1.0	443.6	4.84	338.6	3.16
HTTP 1.1 pipelined*	200.2	2.86	27.6	1.46

*Pipelining allows the browser to retrieve multiple packets simultaneously.

Numbers are based on a high-speed connection between Massachusetts and California.

SOURCE: WORLD WIDE WEB CONSORTIUM, CAMBRIDGE, MASS.

Java

Continued from page 1

acquired last week by Sun for an undisclosed sum.

JavaSoft officials said Animorphic specializes in technology that allows JVMs to run at very high speeds. But they declined to provide specifics, other than to say that Animorphic is not providing a just-in-time compiler such as those already deployed by Sun, Borland International Corp. and others.

Animorphic's Web site claims that Java performance more than doubles with its technology, compared to the best commercial compilers available today. A source familiar with the technology said Java performance is improved, in part, through analysis of large portions of a program, rather than its smaller parts, and extraction of information from everywhere rather than the individual statements or procedures.

THE EVOLUTION OF JAVA

Java Developers Kit (JDK) 1.1 features:

- Digital signatures
- JavaBeans component architecture
- Abstract Windowing Toolkit, which adds printing and other capabilities
- Support for more languages
- Data compression
- Distributed objects for Java applet-to-Java applet messaging

The next-generation JDK will feature:

- Performance improvements based on technology from LongView Technologies
- Java "servlets" that work alone or with others to perform tasks across nets
- Encryption APIs
- X.509 digital certificates
- A shift toward rapid-application development
- About twice as many compatibility tests

The technology can eliminate up to 90% of the dynamic message-sends, the fundamental backbone of object-oriented programming, and monitor programs to detect hotspots where the program spends most of its time running.

Those performance-sensitive regions are optimized on the fly based on how the program is used, according to Animorphic's Web site.

In addition to being faster, Java programs in the future could potentially be safer due to new security being added to JDK 1.1.

Stymied by the U.S. government from putting encryption APIs into Version 1.1, JavaSoft will roll out a U.S.-only version of the JDK with strong encryption while continuing to push for export approval, said JDK marketing manager Eric Chu.

"Over the next 12 months, we'll put in place an end-to-end security solution," Chu said. The next-generation JDK will provide a comprehensive security model based on X.509 certificate generation that can help build user-authentication controls and applet signing.

Chu said the JDK will come with predefined security policies so access controls can be set up without the need for a security expert on staff.

Easing development

The JDK will also start working more along the lines of a rapid-application development tool so programmers can more easily generate Java code. Currently, the JDK forms the basis for Integrated Development Environment tools (see story, page 35).

"We want ease of development," Chu said. "The goal here is not to build a platform for rocket scientists."

More features, such as drag-and-drop services, will be added to the JDK's Abstract Windowing Toolkit for graphical design to further simplify Java application development.

Currently, applets cannot be loaded into a server. But with the future JDK, users will be able to upload "servlets" into a Java server to carry out network-related tasks such as processing of forms.

"The next version of the JDK will be backward-compatible with this one."

Gina Centoni, product-line manager for JavaBeans, JavaSoft

To promote interoperability across Java applications, the next JDK is likely to have 15,000 compatibility tests. The JDK 1.1 that shipped last week has about 8,400.

The future JDK will also be backward-compatible with JDK 1.1, said Gina Centoni, product-line manager for JavaBeans, the component architecture that is part of the JDK 1.1.

She noted that Java licensees are required to move the product line forward as the JDK matures.

"The agreement is they have to support multiple versions of the JDK as it comes forward. And this train is moving fast," Centoni said. ■

Oracle to plug in Web cartridges

Oracle Corp. will use Sun Microsystems, Inc.'s JavaOne conference this April as the stage for introducing its first set of "cartridges" for Web Application Server 3.0.

The initial cartridges, modules that handle specific functions for Web Application Server, will include functions for handling electronic data interchange and tax calculation duties.

Web Application Server itself works with Oracle's Universal Server, a Web server offering. Web Application Server handles transaction-oriented information processing, such as credit card payments or cryptographic enveloping. This frees up the Universal Server so it can more easily deal with incoming Web-based browser traffic.

Vernon Keenon, senior manager of business development for server technologies at Oracle, said during a briefing with *Network World* last week that the first cartridges for Web Application Server will be supplied by third-party vendors VeriFone, Inc., CyberCash, Inc., Taxware International, Inc. and Portland Software, Inc.

Robert Fleming, senior product manager for Internet server products at Oracle, said the company will also be going into production this April with a merchant server cartridge called Apollo. It will handle order entry, payments, tax, shipping and handling.

—*Ellen Messmer*

avidly

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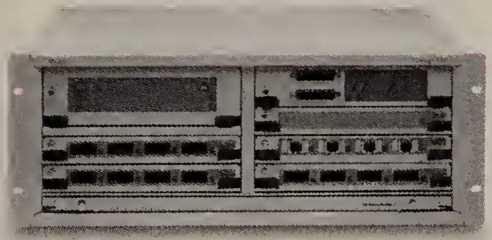

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ManageWise

Continued from page 1

groups of users targeted for software distribution. Given that Novell Directory Services (NDS) can support nets with thousands of end users, so can the new software distribution offering.

Sources close to Novell said ManageWise Distribute is in early beta test and will be announced next month at Novell's BrainShare user conference. The company initially is expected to deliver IntranetWare server-to-desktop software distribution, with server-to-server software delivery to follow later this year.

Novell is also expected to introduce software for accessing ManageWise capabilities via Web browsers at the conference, sources said.

Shelly Dougery, director of marketing for Novell's management products division, would not comment on specific upcoming announcements, but she said the company will detail its ManageWise software distribution strategy at BrainShare.

Novell's Dougery *says the company will detail its ManageWise software distribution strategy at BrainShare.*

Novell currently is on ManageWise Version 2.1, which consists of server and network diagnostics tools, net mapping functions and SNMP traps. It also includes components of Intel Corp.'s LANDesk desktop management tools.

While it is unclear from where Novell is getting its new software distribution technology, it may be coming from LANDesk source code licensed to Novell from Intel last summer.

Novell already offers limited software management capabilities with its Novell Application Launcher (NAL), which has been shipping with ManageWise 2.1 since last September. NAL lets administrators provide end users with onscreen icons that point to servers running preapproved applications.

ManageWise Distribute will carry software management a step further by physically pushing software updates and patches, new applications and data to the desktop.

The NDS integration is key to the ManageWise add-on's capabilities. Because NDS supports all major client operating systems, runs natively on NetWare and several flavors of Unix and is expected to run on top of Microsoft Corp.'s Windows NT Server by this summer, ManageWise Distribute will be one of the first tools to push applications to heterogeneous desktops and servers via a centralized directory store.

The offering sounds good to Rick Soto, a network systems specialist with the Florida State Department of Transportation in Tampa. Soto is moving from a mix of third-party tools to ManageWise so that he can better control the 500 desktop machines in his mixed NetWare 4.1 and Windows NT Server net.

"I chose to go with Novell because they put a lot of management under that single umbrella," Soto said. "When they told me they were adding software distribution, I was pleased because I will use anything that is going to make my job easier."

Easy-to-use, cross-platform software distribution will give Novell a leg up on rival Microsoft, too, analysts said. Microsoft currently can only push applications down to Windows desktops and servers via its Systems Management Server, said Rick Villars, an analyst with International Data Corp. ■

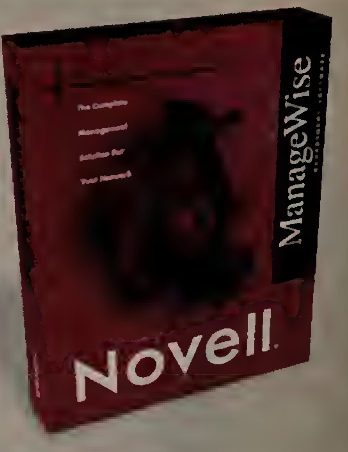
MANAGEWISE ON THE MOVE

Current features:

- Server and network diagnostic tools
- Server configuration data
- Network mapping functions
- SNMP traps that pass data up to high-end systems management tools
- Desktop management, such as remote control and inventory

Coming attractions:

- Server-to-desktop software distribution
- Server-to-server software distribution
- Web-based network management capabilities



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Telecom

Continued from page 1

integrator for international corporate networks. "There are many countries that sign agreements to do lots of things, but interpret them their own way on their own time."

Under the WTO agreement, effective Jan. 1, each of the 65 signatories agreed to allow resale of current monopoly carrier services, interconnect competitive public networks with existing networks, and let foreign carriers buy or build their own networks. From the perspective of U.S. officials, the principal result will be competitive pressure to knock down the high cost of international calling, which now averages 99 cents a minute. "Eventually, a dollar will become a dime," said Reed Hundt, chairman of the Federal Communications Commission.

But most experts said international rate decreases will take a number of years due to the complex system of international pricing. Dozens of foreign governments — including many of the ones that signed the WTO pact — have protested a recent FCC proposal to slice international accounting rates, the charges that national carriers pay for completing one another's calls.

The more immediate impact of the WTO agreement may be to give U.S. carriers the ability to buy up circuits owned by foreign carriers. Once major U.S.-owned carriers acquire more overseas facilities, they may have an easier time guaranteeing network performance via service level agreements (SLA), experts said.

Currently, SLAs are harder to write for global services than for domestic services because foreign carriers "don't have the same type of end-user orientation [as U.S. carriers]," said Vini Handler, director of business solutions for Global One, the Sprint Corp.-led global consortium. "We do [write SLAs], but we do it with a great deal of trepidation," she said.

Now Sprint and its partners may be able to control service quality by running their own local networks in far-flung countries — or even by buying out a national carrier. However, in some key countries, resale of existing services or interconnection with existing networks will be all that is available. For example, Japan refused to sign off on the 100% buyout provision, insisting that no foreign company can buy more than 20% of their telecom giant Nippon Telephone and Telegraph (NTT).

Hundt, who lobbied for the pact around the world, said the Japanese provision was OK with him. "Trying to buy NTT is like trying to buy the Pacific Ocean," he said. "No one has that much money, not even Mr. Gates."

Some larger developing markets have been left out of the equation entirely. China and Russia did not sign the WTO agreement. Hong Kong, which reverts to Chinese control later this year, agreed to open its market only for selected services. Many countries that did sign asked for extra time to implement its provisions (see graphic below). Others said they first have to take the agreement back to their national legislatures.

As a result, analysts and FCC officials expect users to continue to seek alternatives to international dial-up and dedicated circuits, by using callback services and third-country routing to avoid high costs for international circuit-switched traffic. ■

HANDS OFF OUR CARRIERS

Two key countries signed the World Trade Organization agreement but refused to authorize foreign purchase of controlling shares in their carriers.

Country	Percentage limit on foreign control
Canada	46.7%
Japan	20.0%

SOURCE: WORLD TRADE ORGANIZATION, GENEVA

WE NEED MORE TIME

Some of the countries agreeing to let foreign carriers interconnect to domestic and international services and facilities negotiated exceptions to the target date of Jan. 1, 1998.

Country	Negotiated year
Argentina	2000
Belgium	2001
Bolivia	2001
Czech Republic	2001
Greece	2003
Hungary	2004
Indonesia	2005
Ireland	2000
Peru	1999
Portugal	2000
Singapore	2000
Turkey	2006
Venezuela	2000

SOURCES: FCC, WASHINGTON, D.C.; WORLD TRADE ORGANIZATION, GENEVA

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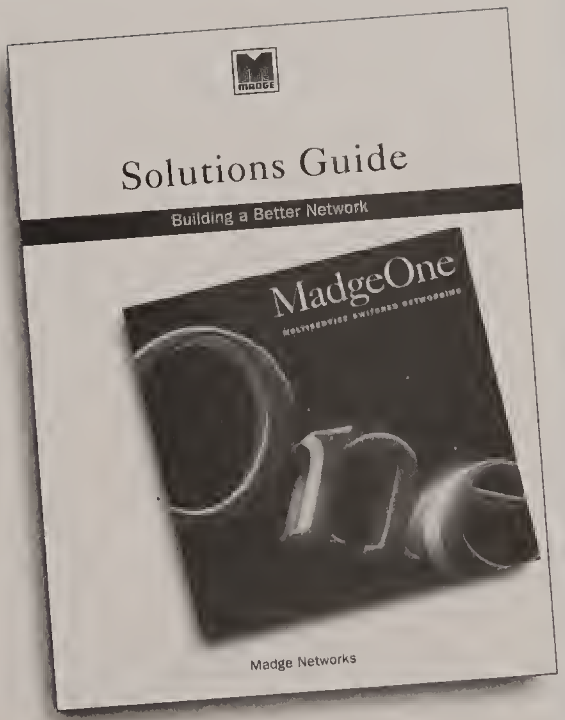

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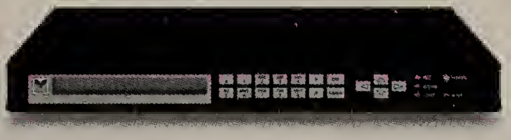

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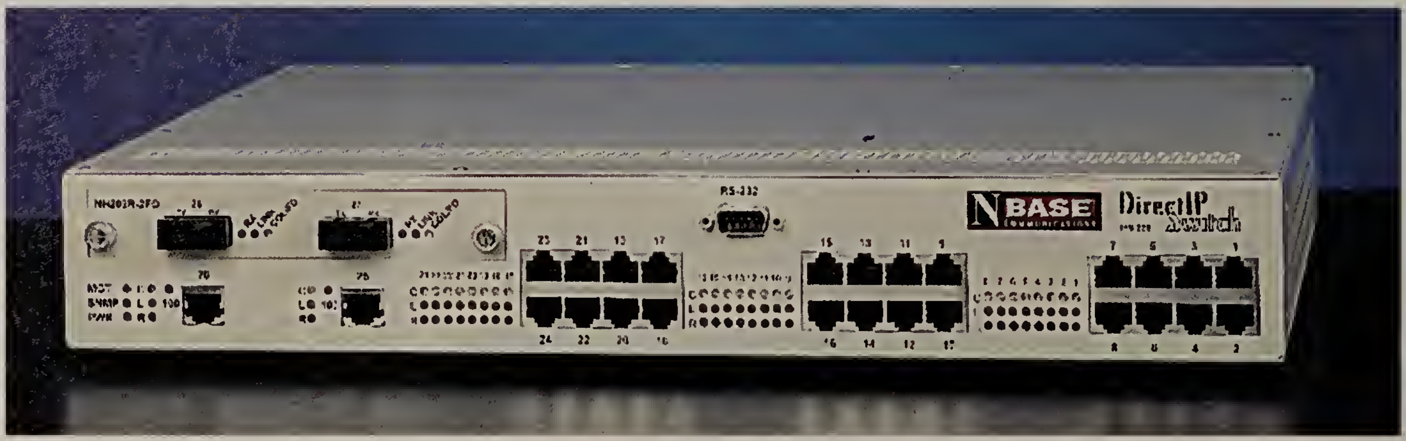
The NBase DirectIP™ switch examines only the first packet in a stream of data and performs security checks to authenticate the connection. Once the connection is allowed, the entire stream will be forwarded to the destination through the switching fabric. By transforming the entire switched network into a huge IP switch, data can be sent much faster than through a router.



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Briefs

■ **Cisco Systems, Inc.** *said it has won a three-year contract to supply* **ATM switches** *to SITA and EQUANT, co-owners and operators of the largest private international communications network in the world. EQUANT did not disclose the value of the deal, but Cisco officials said it could approach $20 million.*

SITA and EQUANT plan to install about 100 Cisco StrataCom BPX switches, which will be interconnected by T-3/E-3 links.

The Cisco switches replace Northern Telecom, Inc. Passport switches at the core of the SITA/EQUANT network.

■ **Compuware Corp.** *last week announced general availability of a new version of its* **network application management product.**

EcoScope 3.0 measures application transaction response times and provides real-time alarms based on response time thresholds and Internet-specific reports identifying impact on the business productivity.

It also allows users to monitor Internet resource consumption site-by-site without violating firewall security. EcoScope 3.0 costs $36,000.

Compuware: (800) 521-9353.

■ **Hewlett-Packard Co.** *announced its HP 300LX and HP 320LX* **palmtop computers** *offer mobile workers the same look and feel as their desktop. Supported by Microsoft Corp. Windows CE, they are equipped with 640-by-240 pixel screens — similar to most standard PC monitors.*

The 300LX supports 2M bits of RAM, and the 320LX supports 4M bits of RAM in addition to a slot for a Compaq Computer Corp. flash card.

The devices are preinstalled with pocket Internet Explorer for mobile Internet access.

The 300LX and 320LX palmtop computers are slated for availability in May for $499 and $699, respectively.

HP: (800) 443-1254.

Tivoli looks to provide security

New package provides centralized security mgmt. features for distributed systems.

By Michael Cooney
Austin, Texas

Users wanting to centrally control access to distributed systems can look to new security management software from IBM's Tivoli Systems.

The company last week introduced the Security Management module for its TME 10 enterprise systems and network management platform that will let users control access to enterprise resources and centrally manage third-party security products from a single TME console.

"Users with distributed computing resources — especially those based on Unix and TCP/IP — have had no way to centralize security control and management," said Mark McClain, director of enterprise solutions marketing at Tivoli.

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NetworkWorld Fusion

The TME 10 Security Management package consists of two components: the Tivoli Access Control Facility (TCAF) and the Tivoli Centralized Security Console (TCSC).

TCAF, developed in conjunction with Memco Software, provides central access control to users on Unix, NetWare or Windows NT operating systems. For example, TCAF administrators can define and enforce logon restrictions to distributed applications on those platforms.

The application also tracks and monitors remote systems for security breaches and provides administrators with a complete audit trail to track user activity.

Existing security packages, such as those found in the Microsoft Corp. Windows NT package and IBM's mainframe-based Resource Access Control Facility (RACF) system, can also feed data into the TCAF application.

Other third-party software firms, such as Axtent Technologies, Inc. and Check Point Software Technologies, Inc., announced support for the TME 10 Security Management package so data from their respective security management products can be integrated with TCAF.

Analysts said the TME Security Management package would give Tivoli another weapon to do battle with its closest competitor — Computer Associates International, Inc. (CA).

"Enterprise security was CA's last bastion of supremacy, and Tivoli needed this tool to compete more effectively there," said Christian Byrnes, vice president of the Service and Systems management arm of META Group, Inc., a consultancy in Reston, Va.

Critics pointed out that the new package did not include much in the way of integration with IBM's own security products, such as its Network Security Processor, which provides data encryption and other services for mainframe-based networks. But McClain said he expects those products will be integrated in the future.

Tivoli's Security Management product will be available by June priced at $2,000 per server and $75 per client.

©Tivoli: (512) 436-8000.

"We are trying to bring mainframe-like centralized security to the distributed environment."

Mark McClain, director of enterprise solutions marketing, Tivoli

OpenVision feels your SAP R/3 pain

By Jim Duffy
Pleasanton, Calif.

OpenVision Technologies, Inc. last week unveiled a suite of systems management applications to control SAP AG's R/3 environments.

OpenVision rolled out Axxion for SAP R/3, a set of integrated applications designed to reduce SAP R/3 operating costs by automating routine systems administration tasks, and configuring application and database servers from a central console.

Users say they are spending tens of millions of dollars on implementing SAP R/3, and tools to ease that burden are sorely needed (*NW,* June 24, 1996, page 1).

Axxion for SAP R/3 includes applications for managing storage, events, performance, availability and security. Missing, though, is a package that would allow users to electronically distribute SAP R/3 software.

But performance, backup and security "is where the most pain is" with SAP R/3, said Steven Aldridge, director of integrated solutions at OpenVision. Software distribution "may be something we plug in in the future," he said.

That would be fine with users.

"What would be of value is if I could automatically update all of those [SAP R/3] client machines, because I have hundreds or thousands of those," said Axxion user Paul Massie, director of IS operations at Bay Networks, Inc. Bay spent in excess of $20 million to implement SAP R/3, Massie said.

Axxion for SAP R/3 features a Web-based Executive Status Console that lets managers determine the health of their SAP R/3 environment and obtain statistics on system utilization, Aldridge said. Users can also access real-time or historical performance data on SAP R/3 applications, database processes or other activities from this console.

Axxion for SAP R/3 will be available in April. Pricing starts at $175,000.

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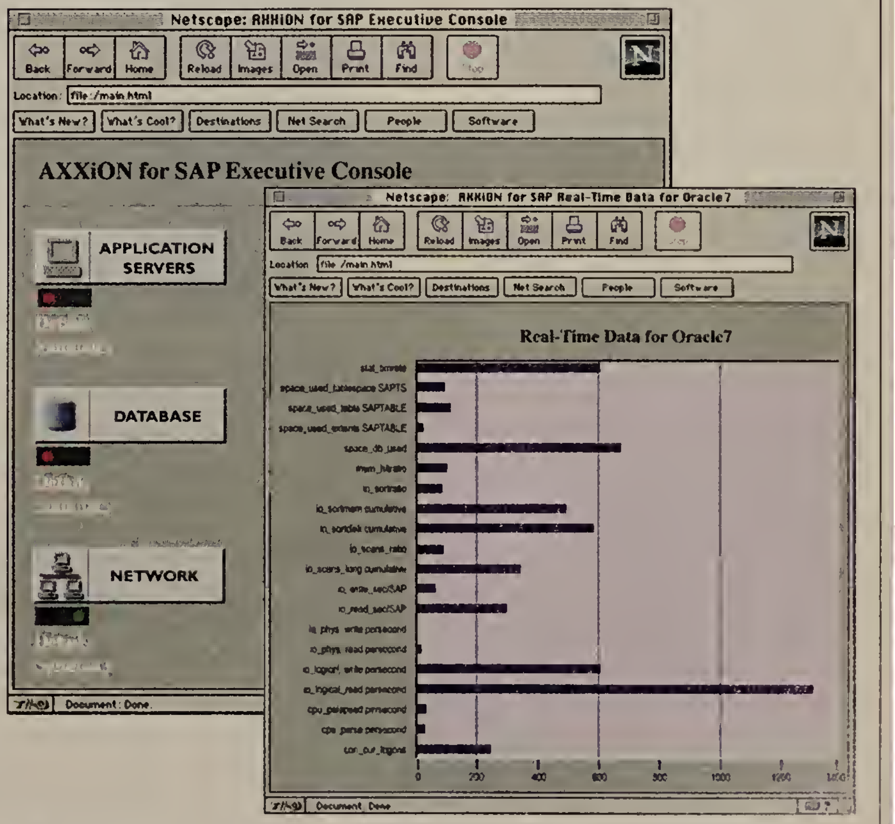

OpenVision's *Axxion for SAP R/3 allows users to view performance data through a Web browser.*

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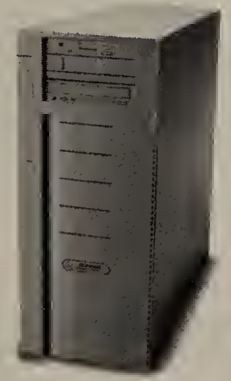

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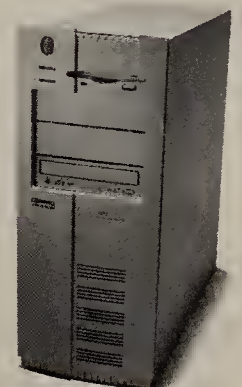

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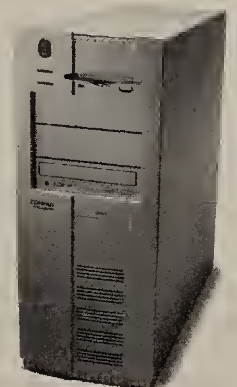

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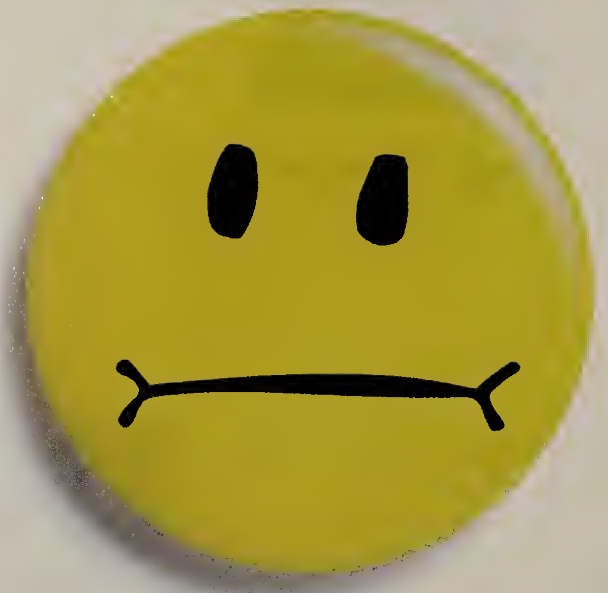

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Carrier Services

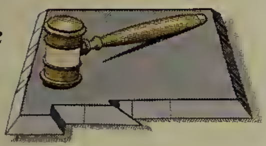
Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

NYNEX Corp. *has applied to sell long-distance services in* **New York** *state. If it wins approval, NYNEX would still need an OK from the Federal Communications Commission before it could sell more than local service within its own operating territory. The FCC is encouraging carriers to get state approval first.*

GTE Mobilnet, Inc. *of Atlanta is expected to introduce a* **Cellular Digital Packet Service** *and analog cellular voice service by the end of April. The combined service lets traveling users access their corporate intranets or Internet Web pages, as well as send and receive E-mail or faxes, all using a single cellular device.*

The New Mexico State Corporation Commission has fined US WEST Communications, Inc. *$125,000 for failing to provide ISDN service statewide. The commission last year ordered US WEST to provide flat-rate ISDN Basic Rate Interface service to businesses at $75.97 per month and residences at $40.86 per month. US WEST countered that it cannot economically provide ISDN to certain locations at those prices. It has appealed the original order to New Mexico's Supreme Court.*



MCI Communications Corp.'s networkMCI division *is enhancing its* **document conferencing service** *with Net Conferencing that will let users log on to a private conference through the Internet.*

Previously, MCI's document conferencing service was limited to users with T.120 document sharing software and only 23 users could join a conference. Net Conferencing extends the service to analog users and boosts the number of participants to more than 200. The service will be available by midyear. Pricing was not available.

DSL field gets crowded

Vendors rely on their ins with carriers to stay ahead.

By Tim Greene

Established vendors are rolling out a variety of new products in an attempt to stave off upstarts in the emerging broadband Digital Subscriber Line (DSL) market.

Last week, ADC Telecommunications, Inc. revealed an 18-month plan to offer a DSL line, called Cellworx, that ADC hopes can make use of the inroads its AAC-3 ATM concentrator has already made into carrier networks. Also, PairGain Technologies, Inc., an established player in the four-wire High-bit-rate DSL (HDSL) market, has introduced an expanded line of DSL modems and concentrators.

The competition for carrier business has continued despite an agreement among four regional Bell operating companies to buy DSL hardware from Alcatel Data Networks, Inc.

While Alcatel hardware promises to offer 6M bit/sec over regular copper phone lines, it is not ready for deployment.

That leaves a window for other vendors to stake a claim in the DSL market and for carriers to roll out services sooner but at more modest speeds. US WEST, Inc.'s initial DSL offerings, for example, top out at 768K bit/sec.

ADC's product plans

During the next 18 months, ADC will bring out a family of Cellworx DSL gear that will rely at first on two-wire HDSL, which supports speeds up to 768K bit/sec.

The company will offer Subscriber Access Router (SAT)-300, a renamed version of its current customer-end Pacesetter HDSL modem.

ADC is also shipping the Remote Access Concentrator (RAC) System, an access concentrator that will be used by service providers to aggregate 28 individual customer lines.

This fall, the company will add an HDSL card that lets carriers terminate two-wire HDSL lines at bandwidths up to 768K bit/sec on its existing AAC-3 ATM bandwidth manager.

And early next year, the company will bring out a service termination node that sits on a Synchronous Optical Network (SONET) ring and sends DSL traffic to the switched backbone of the carrier network.

About the same time, the company will introduce a PC card, called the SAT-100, that will incorporate rate-adaptive DSL, which can be adjusted to offer different bandwidths to accommodate line conditions.

ADC gets into DSL

ADC Telecommunications is starting to roll out its Digital Subscriber Line (DSL) gear.

Product	Transport	Ports	Price
SAT-300	HDSL	1	$1,195
RAC System	HDSL	28 (56 lines)	$1,195 (per module)

PairGain's rollout efforts

Meanwhile, PairGain has plans to roll out three customer premises modems and a pair of concentrators for carriers.

The products include Megabit Modem HRA, which supports speeds of up to 1M bit/sec in both directions and is priced at $1,195; Megabit Modem CRA, which costs $1,695 and offers up to 2.5M bit/sec downstream and 1M bit/sec upstream; and Megabit Modem C1500, which is priced at $1,595 and offers Asymmetric DSL with 1.6M bit/sec toward the user and 64K bit/sec away.

Also new are the modular AccessHub and AccessGate. The AccessHub, priced at $995, supports 14 Ethernet ports, each of which handles a single DSL interface. AccessGate, which costs $1,295, supports a single Ethernet port and a T-1 interface. It was designed to back-haul DSL services.

AccessHub and AccessGate will be available this quarter. The modems will ship midyear.

©ADC: (800) 366-3891; PairGain: (800) 370-9670.

Telecom regulation

Proposals resurface to tack extra charges on ISDN and call setup

By David Rohde

Washington, D.C.

Two little-noticed proposals tucked away in a key government rulemaking could increase costs for users with switched digital services or heavy transaction traffic.

In the first proposal, the Federal Communications Commission is seeking comment on whether to impose additional monthly subscriber line charges (SLC) on ISDN users. In the second motion, the FCC is considering a new call setup charge that would fall heavily on users of transaction services such as credit card verification and insurance claims processing.

Both ideas — buried deep in the FCC's massive Dec. 24 proposal to reform the way access charges are paid to local exchange carriers — are rehashes of proposals previously rejected or set aside by the FCC.

But now, Congress has directed the FCC to change the complex way local carriers are subsidized for constructing and maintaining local loops. By May, the FCC must explicitly match local access fees to costs, and both proposals attempt to achieve that goal.

After a firestorm of protest two years ago, the FCC waived its rule that users must separately pay the required federal $6-per-month SLC for derived channels on an ISDN Basic Rate Interface and for all 23 or 24 bearer channels on a Primary Rate Interface.

The FCC is no longer proposing to charge for each derived channel. But now, using cost figures supplied by regional Bell operating companies, the FCC is suggesting that the new SLC on a BRI could be 1.24 times the regular charge and PRIs could be hit up for 10.5 times the regular charge. The result is still a potentially steep cost increase for users (see graphic).

A key user group has warned the FCC that basing its new SLC on cost figures supplied by RBOCs may be unreliable. The Ad Hoc Telecommunications Users Group late last month urged the FCC to collect more data before plowing ahead.

"To date, the carriers have furnished insufficient cost support to permit any decision on ISDN or derived channel SLCs," said Colleen Boothby, an attorney here for the users group.

In addition, several times in the past, RBOCs have asked the FCC to allow them to impose a call setup charge on users, arguing that they incur costs but receive almost no per-minute compensation for short transaction-oriented calls.

The FCC has always rejected such requests — most recently one by US WEST, Inc. in 1992 — but now says it will consider such an idea as part of the broader change in access rules. Both Ameritech Corp. and Pacific Bell already have weighed in in favor of the proposal.

BEARING THE COST

Under the FCC's proposal, monthly ISDN subscriber line charges would be:

Basic Rate Interface	$7.44*
Primary Rate Interface	$63.00*

*Based on a $6-per-month analog line charge

SOURCE: FCC, WASHINGTON, D.C.

Randolph May, an attorney for CompuServe, Inc., charged in a letter to the FCC that RBOC support for a new call setup charge is hypocritical.

May noted RBOCs have recently complained that Internet and other online usage are straining local telephone networks because user sessions are too long.

"It certainly follows that short duration calls — such as credit card verification calls handled by CompuServe, which average 12 seconds in length — contribute to the efficient operation of [local] networks," May wrote in his letter to the FCC. ■

WAN MONITOR

Network integrators can be lifesavers

Ever feel like you're always in a sink-or-swim situation when trying to optimize your router-based networks? You are probably not alone.

Network optimization is critical as the number of end users grows, bandwidth-hungry applications are integrated, more protocols are added, the degree of network connectivity increases, and new technology and service choices become available. Unfortunately, you probably have limited resources to evaluate and optimize your network properly. You may want to look for help from a service provider or systems/network integrator.

With most network optimization services, the scope of the work is customized, as is pricing. The total cost usually depends on the complexity of the network, number of routers, type of routers, mix of protocols and number of hours to complete the work, among other factors. However, some prepackaged services, such as Alltel Information Service's new NetKnowHow for Cisco Networks, are available today. This service includes net information, analysis, recommendations and implementation of software changes.

AT&T's new managed network service suite includes prepackaged design and optimization options. The prepackaged services have a standard set of deliverables and standard package pricing. Depending on your needs, prepackaged services may offer a more cost-effective solution than customized services.

Daniel Briere and Christine Heckart

When evaluating optimization services, look for a comprehensive capture of router network topology, configuration, performance and traffic baseline information; analysis of current network status; determination of the effects of planned configuration changes to address problems identified by the baseline data; evaluation of network utilization, with simulations to assess the impact of net configuration changes; simulation of the impact of network growth; recommendations for the final design, including configuration, protocol, bandwidth, connectivity and topology modifications; ability to implement recommended changes; and ability to provide post-implementation status updates.

Before you sign a contract, understand the content and time frames for each deliverable. For example, if the network integrator includes a baseline error report, then ask for details about the types of errors that will be identified, such as access list errors, overlapping or incorrect subnet masks, redundant addresses, mismatched encapsulations, blocked routing updates and others.

In addition, evaluate the type of routers, LAN topologies, WAN technologies and network protocols supported by the service provider to ensure that the network integrator has the tools and expertise to optimize your entire network.

Contracting with a network integrator allows you to leverage its expertise in optimization, gives you the capability to anticipate and intercept potential network anomalies, and lets you allocate your people to other problems.

Briere is president and Heckart is director of broadband at TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and heckart@telechoice. com.

NetworkWorld
TECHNICAL SEMINARS

IPv6
THE NEXT GENERATION FOR TCP/IP INTERNETWORKS

The next generation of Internet Protocol — IPv6 — will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol – Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

Whether you are a network manager, designer or software developer, this seminar, taught by internetworking expert Mark Miller, will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

12 TOPICS YOU DON'T WANT TO MISS!

1. Learn how the implementation of IPv6 will allow continued expansion of the global Internet
2. Explore the effects of IPv6 on other elements of your internet or intranet architecture
3. Understand the limitations of the current Internet Protocol — IPv4
4. Discover key features of IPv6, including larger addresses and security
5. Learn details of the proposed IPng solutions: CATNIP, TUBA and SIPP
6. Understand the key functional and protocol enhancements incorporated into IPv6
7. Analyze the formats of the IPv6 packet header, Extension headers, ICMPv6 messages and Neighbor Discover messages, and others.
8. Gain detailed insights into how the IPv6 transition will affect other protocols, such as Ethernet, token ring, RIP and OSPF
9. Learn how to strategically plan your transition from IPv4 to IPv6
10. Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Sun and others are implementing IPv6
11. Learn about the 6Bone — a worldwide IPv6 network
12. Discover how to obtain public domain sources of further information on IPv6

Enterprise Network Management
Understanding SNMP, SNMPv2 and RMON

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. Today's enterprise network management systems need to manage thousands of elements — from the hardware devices all the way to the applications and processes running on these networks.

SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management. Recent enhancements to the SNMP-based technology, including SNMPv2, RMON2 and Web-based management tools, improve this popular system. With those enhancements, however, come additional challenges for the network manager.

This one-day, information-packed seminar, taught by internetworking expert Mark Miller, will help you understand the elements of an SNMP-based network management system, how to implement SNMP with your internetwork, plus the various enhancements such as the new message formats and improved error codes provided with SNMP version 2. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork. In addition, you will see how SNMP is being used to manage broadband networks, including frame relay, SMDS and ATM.

You will also be introduced to the next generation of network management: Web-based tools that integrate SNMP and browser technology. This new technology consists of three components: network management software which runs on a Web server, proxy agents which operate on the managed devices, providing updates to the Web server, and a browser-equipped workstation that can access those management details from any location within the enterprise.

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2. Compare and contrast the ISO, IEEE, DMTF and Internet network management architectures
3. Discover the next-generation architecture of enterprise management tools: the Web-based managers and agents
4. Understand the key components of the Web-based Enterprise Management: the HyperMedia Management Schema (HMMS), the HyperMedia Object Manager (HMOM) and the HyperMedia Management Protocol (HMMP)
5. Learn the details of the key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP
6. Discover how existing Web-based enterprise managers and existing SNMP-based devices can be integrated into a cohesive system
7. Understand the enhancements found in SNMPv2, plus the proposed security enhancements: SNMPv2u and SNMPv2*
8. Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats
9. Understand the key differences between the RMON and RMON2 standards for remote management of the enterprise
10. Consider strategies for the coexistence of SNMP version 2 with existing SNMP version 1 systems

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- *Exclusive protocol reference guides: TCP/IP, IPv6 and OSPF*
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- *Luncheon and break refreshments*
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Local Networks

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Hubs • Switches • Adapters and other equipment

riefs

Needham, Mass.-based **\Nart Corp.** *has rolled out a* **ırt-switching hub** *designed · LAN segmentation. The ·itch Companion Hub provides shared Ethernet ports that ·ach to eight independent 10M ·/sec segments. The device, ·ich can be stacked up to five ·its high, switches traffic ·ong the separate segments.*

Pricing for the Switch Com-nion Hub starts at $1,055. The oduct is available now.

LANart: (800) 292-1994.

10M/100M bit/sec Ether-·t adapter card *prices have ·ken a dive of late, with the top ·ree vendors dropping their ·ices below the $100 mark to ·ur migration to Fast Ethernet.*

3Com Corp. *announced the ·st EthernetLink XL 10/100 PCI ·rd for $94 in packs of 100. Sim-·rly,* **Intel Corp.** *reduced the ·ice of its EtherExpress Pro/100 ·apters by 40% to $84 for a pack ·80.*

Not to be outdone, **Standard ·icrosystems Corp. (SMC)** *·shed the cost of its EtherPower ·/100 card to $95. Previously, ·st Ethernet adapters generally ·d for about $150.*

3Com: (408) 764-5000; Intel: ·8) 765-8080; SMC: (800) 762-·58.

Tricord Systems, Inc., *·e of the first companies to offer ·h-powered machines called ·erservers, earlier this month ·nounced it will drop out of ·t market to focus on develop-·* **Windows NT server ·ftware.**

The company lost $15.2 mil-·n last year and $37.2 million ·1995. Tricord will continue to ·and service its line of Power-·me servers through 1997.

Tricord: (612) 557-9005.

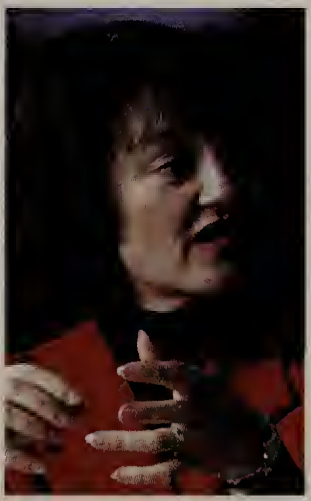
Windows NT

Microsoft focuses its eyes on the enterprise

Deborah Willingham, vice president of the Enterprise Business Unit, looks to keep up with NT installations.

Ready or not, Windows NT Server is finding its way into the enterprise, and Microsoft Corp. is taking great pains to improve the level of service and support it offers to its biggest customers — those with upward of 2,500 desktop machines.

Network World Editor in Chief John Gallant and Senior Writer Christine Burns recently sat down with Deborah Willingham, vice president of Microsoft's Enterprise Business Unit, to discuss how the Redmond, Wash.-based software giant is catering to these customers.



How has the number of enterprise customers grown in the past year?

We have about 3,500 enterprise customers worldwide. We offer varying degrees of consulting and on-site support through this unit.

But the best demonstration of growth is in our Premier Support, which is global 24-by-7 mission-critical support. We have over 1,500 Premier customers today, and we grew that number over the last 12 months from 800.

What percentage of Microsoft's overall revenue comes from enterprise customers?

About one-third of Microsoft's revenue comes from the enterprise accounts.

How is that shifting?

It is a fast-growing segment of our revenue. We have great momentum in the enterprise with Windows NT right now. We are outselling Unix, and we are outselling NetWare.

Quite a few standardization decisions are happening inside companies, with people upgrading their infrastructure to 32-bit with Windows NT Server. More and more NT Servers going in as new applications are rolled out inside these large companies.

We also think it has strategic importance even beyond that big portion of our revenue.

Many small and medium businesses look to these larger companies and the decision they make about products to help them make decisions on products.

Is it your sense that the number is growing?

Absolutely, every day. Windows NT Server is becoming more the de facto decision for them. They know they are going to go there. Many enterprise CIOs tell me that they want to get to NT Server; it is just a matter of timing, when and how they want to do that.

Is this enterprise service unit viewed as a profit center or as a cost of doing business with these big customer?

It is a break-even business model. By investing in high-quality services for the enterprise, we built long-term relationships, and that will result in additional product sales into those accounts.

How do you answer industry criticism that Microsoft is too self-centered on its products to understand the requirements of big corporate environments?

Regardless of the fact that we have come from the desktop, the important thing is that we have arrived in the enterprise front and our customers are satisfied. Ninety-eight percent of our Premier customers say they are satisfied [with our service].

We recently surveyed enterprise accounts across the board that looked at services as well as our selling model, product quality, how we license, whether they think we are a visionary company and whether we are considered a strategic partner. In overall satisfaction, our customers say we are on par with both IBM and Oracle.

Two years out, what is the goal of Microsoft's enterprise division?

Two years from now, people will see that one of the major improvements driven by Microsoft will be lowering the overall cost of computing.

Comparing the Microsoft of two years ago with the Microsoft of today, how is the company now better in the enterprise?

Our products are more enterprise-ready. The focus on interoperability and scalability of our products is definitely shown in the results of what we have delivered.

Our services are greatly improved — both what we do directly for the enterprise as well as the capabilities in the channel around Microsoft technology.

Every aspect of what we have been doing in the enterprise has been on a continuous improvement cycle. The real acceleration has come with Windows NT. And you can see in the sales of that product that we have gotten to that momentum point now, for more and more people are buying that platform.

That encourages application developers to write to the platform, which encourages more people to buy. So you get in that nice win/win cycle.■

Get more Windows info online.
- A review of NT 4.0
- Reviews of directory and management tools for NT

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Everex Pentium Pro server to debut

Step Pro RAID Server primed for distributed applications.

By Terho Uimonen
Fremont, Calif.

Everex Systems, Inc. next month will introduce a new Pentium Pro server at the CeBit trade show in Hannover, Germany.

The company's Step Pro RAID Server line targets messaging, World-Wide Web and database application environments, company officials said.

The server is available now in single- and dual-processor Intel Corp. Pentium Pro configurations running at speeds of 150, 166, 180 or 200 MHz.

The server comes in a new rack-mountable tower chassis with 11 front-access expansion bays, one 3.5-inch floppy drive, four exposed 5.25-inch peripheral bays and six internal 5.25-inch bays.

Options include a PCI-based caching RAID controller, which supports as many as 32 hard drives through a dual-wide SCSI channel that has features such as on-the-fly capacity expansion.

Pricing starts at $4,999.

For more information, contact Everex at (510) 683-2009.

Uimonen is a correspondent for the IDG News Service bureau in Taipei, Taiwan.

WIRED WINDOWS

Microsoft's ugly NT upgrade plan

If you bought Novell, Inc.'s NetWare 2.X in 1987 and wanted to upgrade to IntranetWare (NetWare 4.11) today, you'd need only purchase IntranetWare and follow the upgrade instructions.

If you purchased Windows NT Server 3.51 in mid-1996 and wanted to upgrade to Windows NT 5.0 — the so-called Cairo release, due late this year — it won't be so simple. Microsoft expects you to first upgrade to NT Server 4.X, then buy NT Server 5.0 and upgrade again.

As reported recently (*NW,* Jan. 27, page 1), there are quite a few network managers who don't like this upgrade approach. Their feeling is that NT Server 3.51 is a proven operating system with few, if any, bugs. NT 4.X, though, has been a disappointment to many who think there's no reason to make the upgrade. NT 5.0 promises better enterprise directory services than 3.51 or 4.0, and many network administrators are eager to try it.

Now doing that upgrade from NetWare 2.X to IntranetWare also involves an intermediate upgrade. You first upgrade to NetWare 3.12, then to 4.11. The difference between this and what's reported to be the case for NT Server is that Novell includes the NetWare 3.X software in the IntranetWare box, and the upgrade is a well-integrated move from NetWare 2.X to 3.X to 4.11

I'd guess Microsoft isn't worried about this, though, since a recent press release from Redmond was titled "Microsoft Corp. today announced new data showing that the Microsoft Windows NT Server network operating system was the world's best-selling server operating system in 1996."

Sounds impressive until you read between the lines. What it doesn't say is that NT was the best-selling network operating system because Microsoft doesn't — at least publicly — discriminate among the ways NT is used. Users that decide to use Exchange for E-mail, SQL Server for a departmental database or Internet Information Server for their intranet also have to install NT Server. So even if you run your enterprise on NetWare, Microsoft will count and report your SQL Server purchases as NT Server installations.

Dave Kearns

Remember, too, that even as a network operating system, Microsoft's staunchest defenders have never claimed it will support as many users as NetWare. So two similar networks almost always will have two to four times as many NT servers as NetWare servers. Tellingly, Microsoft never reports the number of network clients purchased or installed.

Tip of the week

Continuing our quest to get you as much network security information as possible, here's another good site to check out, this one maintained by Randy Crawford, information security officer for the University of Texas Medical Branch at Galveston. Point your browser to www.utmb.edu/is/security/misclink.htm.

There's still time to let Microsoft know that you don't appreciate the upgrade plan for NT 5.0. Call your Microsoft representative, or E-mail sales@microsoft.com.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

ATM

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Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

Speedware Corp. *has released Version 4.0 of Esperant, an end-user* **query and reporting tool.** *The Toronto company's new version offers faster and easier reporting, more complete charting and graphing features and a redesigned user interface. Esperant costs $595 per user for one to eight copies.*

Speedware: (800) 447-0745.

Poet Software *of San Mateo, Calif., has released software that lets developers write Java applications for storing and accessing data in Poet's Universal Object Server database. The software developers' kit is aimed at C++ programmers because it still relies on a C++ layer to compensate for managing the database objects. The kit is priced at $499.*

Poet: (415) 286-4640.

Banyan Systems, Inc. *of Westborough, Mass., last week announced the shipment of* **BeyondMail Professional 3.0,** *an enriched Internet E-mail client from Coordinate.com, the company's Internet division. BeyondMail 3.0, which retails for $69 per client, includes 89 defined user actions, a four-tiered address book, ActiveX support and remote access enhancements.*

Coordinate.com: (617) 398-7900.

Cambridge, Mass.-based **Torrent Systems, Inc.** *has announced Orchestrate 1.1, an updated application development tool for building and running parallel applications used in* **distributed data warehousing and data mining systems.** *The product's new Shell Command Interface lets groups of programmers build systems without having to work with the underlying parallel computer operating system.*

The software is priced at $8,000 per processor and will be available by June.

Torrent: (617) 354-8484.

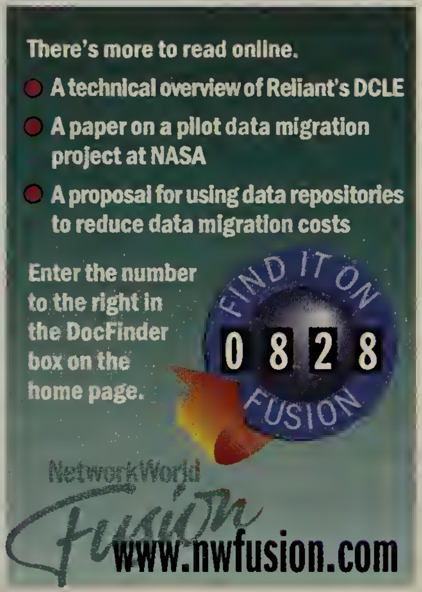
New tools speed data conversion from legacy to client/server apps

Reliant's DCLE, Apertus' Enterprise/Integrator among first products in their class.

By John Cox
Austin, Texas

Your company's biggest asset — its data — can turn into its biggest liability when you try to transfer the data into new client/server applications or a data warehouse.

But an emerging crop of data migration tools promises to automate much of this work, allowing MIS groups to more quickly convert data in mainframe VSAM flat files, for example, into tables for an Oracle Corp. or Sybase, Inc. relational database on a Unix server.


There's more to read online.
- A technical overview of Reliant's DCLE
- A paper on a pilot data migration project at NASA
- A proposal for using data repositories to reduce data migration costs

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NetworkWorld Fusion

Two of these tools are Reliant Data Systems, Inc.'s just-released Data Conversion Language Engine (DCLE) and Apertus Technologies, Inc.'s upcoming Enterprise/Integrator.

Both are server-based programs that not only convert one data format to another, but also blend data from different sources and even transform it through operations such as adding and averaging. DCLE can also convert host data into HTML format for Web documents. All the while, these products ensure data consistency and accuracy.

By contrast, most existing tools focus on one part of this process, or are designed to generate COBOL or other code for extracting and transforming data, said Wayne Eckerson, an analyst at Patricia Seybold Group, Inc. in Boston. Players in this market include Evolutionary Technologies International, Inc. (ETI) and Carlton Corp.

Running as a server application, Reliant's DCLE reads and analyzes large host data files, including the metadata, which reveals important identifying information about the data. DCLE then creates a diagram of the data and its interrelationships that is accessible to systems and database administrators via a graphical user interface (GUI).

The administrators can use the client component of Reliant's software to create business rules for manipulating the data. Then with mouse clicks, they can map source data into the structure of the target database or application. Finally, DCLE creates a file that is loaded in to the target database or application.

One possible drawback to this approach, Eckerson said, is that DCLE lacks the ability of some other tools to extract data from legacy systems and to do so at a detailed level. "You may have to run a lot more data through the engine compared with being able to identify the exact records you want and extracting only these," he said.

DCLE is available now, and pricing varies based on customer configuration.

Apertus' Enterprise/Integra-

See New tools, *page 30*

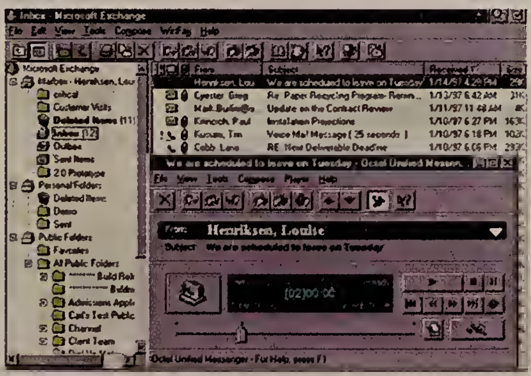
AUTOMATIC DATA CONVERSION

Product:	Reliant's Data Conversion Language Engine (DCLE)
What it is:	Server software, configured with a drag-and-drop GUI, that automatically moves and transforms data from one database or application to another.
What it does:	Lets customers easily shift data from legacy systems into client/server databases or distributed applications.
Availability:	Server software runs on NT and popular Unix systems; GUI runs on Windows 95 and NT.
Pricing:	Varies based on number of copies and sites, scope of the data migration projects and so on.

Octel unifies voice mail and E-mail

By Paul McNamara
Milpitas, Calif.

Years after first hyping the concept, Octel Communications Corp. last week delivered Octel Unified Messenger, client/server software that gives end users a single mailbox for fielding E-mail over the phone and voice mail via a PC.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Octel Unified Messenger

Octel Unified Messenger *combines voice mail and E-mail in a single mailbox, allowing customers to review, reply to, forward and delete both types of messages from either a PC or telephone.*

Analysts and users said Octel's offering, unveiled at Internet/E-Mail World Expo in San Jose, Calif., is well worth the wait and positions the company ahead of competitors such as Lucent Technologies, Inc. and Active Voice Corp.

"It's the first truly unified messaging system on the market," said Paul Stockford, an analyst at market researcher In-Stat in Scottsdale, Ariz. "We've seen some systems from other vendors where you've got an E-mail server and a voice mail server and a server in the middle that acts as a monitor. . .[but] that requires two directories."

Not so with Octel's product, which works exclusively with Microsoft Corp.'s Exchange Server to merge onto a single machine what has until now been a coordination challenge for network managers.

"The one thing [Octel does] that we really like is sharing the same directory structures as Microsoft Exchange," said Bob Jaglowski, senior MIS manager at Harris Semiconductor Systems in Palm Bay, Fla. "I don't have another set of directories sitting off on a voice mail server. That saves us administrative time."

Unified Messenger server software, which runs on Microsoft Exchange Server 4.0 and 5.0, provides text-to-speech capabilities and a telephony user interface, as well as integration between most PBXs and a PC voice card that sits on the server. The card requires 32M bytes of RAM and 1G byte of disk space. The client — which calls for Windows 95, or NT 3.51 or 4.0 — provides the single in-box interface to E-mail, voice and fax.

Unified Messenger translates E-mail text into speech that users can retrieve and respond to from any telephone or cellular phone. The system also allows voice messages to be embedded into E-mail, which recipients can replay using a PC's multimedia capabilities or a telephone.

Octel Unified Messenger, which the company intends to extend to other E-mail systems, will ship in May at a cost of about $200 per user.

©Octel: (800) 444-5590.

Digital sells middleware products to Bea

By Rebecca Sykes

Digital Equipment Corp. last week said it will hand off three middleware products to Bea Systems, Inc.

Pending U.S. government approval, Bea will purchase Digital's ObjectBroker object request broker, DECmessageQ message queuing middleware and ObjectBroker Desktop Connection, which allows ActiveX-based applications to interact with ObjectBroker-based objects. The offerings are designed to help customers simplify and speed the development and deployment of distributed applications.

Bea also will port its Tuxedo middleware engine — which already runs on Digital's Unix and Microsoft Corp.'s Windows NT — to Digital's OpenVMS platform. In addition, Digital will assume an equity position in Bea and work with the company to get ObjectBroker and DECmessageQ running on Digital Alpha platforms.

The companies refused to disclose financial terms of the agreement.

The agreement is good for both parties, analysts said. Bea will gain solid technology and expand its presence to include large accounts dealing with legacy environments, said Richard Buchanan, program director at META Group, Inc. in Peterborough, N.H.

For Digital, selling the technology makes sense given its recent decision to focus on the Internet as it battles back from a shaky financial period, Buchanan said.

Another analyst agreed that the deal fits Digital's strategy.

"[Digital has] very good technology but has not made it a focus," said Melinda Ballou, a senior research analyst with META Group in Waltham, Mass. Instead, it has turned to hardware, especially Alpha, she said.

But in some ways, the sale of the technology sends the industry a mixed message about Digital.

"It demonstrates that there is an R&D and technology function within Digital that is capable and relevant to this new world of computing, even if they can't market it," Buchanan said. "The downside is it makes the unfortunate point that Digital can't market its way out of a wet paper bag."

Sykes is a correspondent for IDG News Service in Boston.

New tools

Continued from page 29

tor, now in development, also uses a server-based engine and GUI. The product will also make use of files for periodic or batch conversions between systems. But via IBM's MQSeries transaction messaging middleware, Enterprise/Integrator will let users capture and migrate transactions among different applications, according to the vendor.

More details will be announced at the formal product release in April.

The key reason for using these tools is they capture metadata and document how you have gone about transforming data, Eckerson said. This valuable information usually is poorly documented or missing completely in home-built data conversion code.

In evaluating these tools, MIS groups should look closely at what metadata is recorded and how it is presented. Other key points to consider are how easily the tool can be extended to handle new transformations and how the tool can call an existing external routine that has already been written.

©Reliant: (800) 713-7070; Apertus: (800) 793-3509.

NetworkWorld
TECHNICAL SEMINARS

"Frame relay has quickly become the foundation for many corporate WANs, offering significant cost savings and flexibility. But building and managing a frame relay network requires new skills and expertise."
John Gallant, Editor-in-Chief Network World

Implementing
FRAME RELAY
Strategies and Solutions

Don't Miss It!

Seminar Overview

Frame relay offers companies the chance to increase network performance while decreasing their costs of operations. As a result, frame relay has become the fastest growing data service in the industry and is only matched by the growth rate of the Internet. Since its introduction nearly five years ago, thousands of companies have chosen frame relay to give them efficient and effective wide area communications.

Implementing Frame Relay: Strategies and Solutions will help you decide whether frame relay is the right service for your company, and you will learn what benefits you can expect from implementing a frame relay network. In addition, this seminar, taught by Tom Jenkins of TeleChoice, Inc., a frame relay expert, will explore which applications perform well on a frame relay network and which carriers you need to consider in your evaluation process.

Even if you have already implemented a frame relay network, attending this information-packed one-day seminar will teach you the new features and services available in the market and how they can benefit your company.

Whether you are a network/telecom planner, manager, designer or administrator, **Implementing Frame Relay: Strategies and Solutions** will provide you with the information and insight necessary to more efficiently and effectively implement and manage your network.

12 Key Benefits of Attending . . .

1. Explore the inherent benefits of using frame relay
2. Learn when frame relay is a more economical solution than other service options
3. Understand the limitations and benefits of using NNIs
4. Discover which frame relay service features are significant and which are merely hype
5. Gain an understanding of the direction of the frame relay market
6. Analyze the differences between major U.S. frame relay providers
7. Learn how to save money by consolidating your voice and data applications over frame relay
8. Understand the alternative approaches to running SNA applications over frame relay
9. Learn how pricing structures differ among carriers and how you can take advantage of these differences to obtain the best service bargain
10. Analyze case studies of various network types to see how frame relay can be best implemented
11. Learn about new and likely future service enhancements which could impact your network
12. Examine your existing carrier and services features to see if they are best suited for your current and future network requirements

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IPv6: The Next Generation for TCP/IP Internetworks .... *page 4*

Enterprise Network Management: Understanding SNMP, SNMPv2 and RMON .... *page 5*

Internetwork Design and Analysis .... *page 6*

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Fast LAN SOLUTIONS
Technologies and Applications

Directed by: Scott Bradner

Seminar Overview

Today's local data networks are in a period of rapid transition. They are moving from an environment designed to support simple, best effort client/server and remote resource access applications to one that includes far greater traffic. This new class of network-based applications requires high reliability and real-time performance guarantees while at the same time operating under tremendous pressure to minimize cost of ownership.

Fast LAN Solutions: Technologies and Applications, taught by internetworking expert Scott Bradner, will prepare you to successfully manage these new demands on LAN design. This information packed one-day seminar will help you evaluate each of the technologies vying to replace existing Ethernet and token ring networks. Through information-rich case studies the presenter will highlight real-world fast LAN solutions for you to consider in your own LAN design.

Seminar Outline

1. Introduction

   Many modern networks are under the twin threats of traffic overload and the impending deployment of real-time applications. Throughout the day we will explore the ways in which fast LAN technologies can be used to overcome these challenges. This section provides an overview of what the seminar includes and an assessment of what particular topics the attendees are most interested in to best meet their learning objectives.

2. Performance Requirements of Today's Local Area Networks
   - applications driving network traffic loads
   - the effect of network scale on performance requirements
   - throughput and forwarding rates required in networks
   - how protocols and applications are affected by latency

3. Quality of Service Implications
   - the effect of applications on quality of service requirements
   - traditional service quality agreements
   - different types of quality of service controls including ATM and RSVP

4. Fast LAN Technologies - Options & Issues
   - switched Ethernet
   - switched token ring
   - Fast Ethernet
   - switched Fast Ethernet
   - Gigabit Ethernet
   - FDDI
   - ATM

5. Flattening vs. Routing
   - breaking up broadcast domains
   - using routers as security firewalls
   - manageability implications
   - future routing technologies, e.g. NHRP

6. Utilizing Virtual LANs in High Performance Networks
   - VLAN technology in different types of LANs
   - interoperability between VLAN systems
   - VLANs and routing
   - VLANs and server placement
   - VLAN management differences

7. Sample Network Designs Utilizing Fast LAN Technologies
   - single building LAN
   - distributed multiple building
   - multiple building using collapsed backbone
   - integration with WANs
   - integration with legacy LANs

8. Managing Fast LANs
   - Is network management different for high performance LANs?
   - new management features in high performance LAN products
   - the importance and use of RMON and RMON II
   - the impact of LAN type on network management complexities
   - support of network management by device vendors
   - problems with current network management tools

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Implementing FRAME RELAY

Strategies & Solutions

Directed by: Thomas Jenkins

Seminar Overview

Frame relay has become the fastest growing data service in the industry and is only matched by the growth rate of the Internet. **Implementing Frame Relay: Strategies and Solutions** will help you decide whether frame relay is the right service for your company and you will learn what benefits you can expect from implementing a frame relay network. In addition, this seminar, taught by Tom Jenkins of TeleChoice, Inc., a frame relay expert, will explore which applications perform well on a frame relay network and which carriers you need to consider in your evaluation process.

Even if you have already implemented a frame relay network, attending this information packed one-day seminar will teach you the new features and services available in the market and how they can benefit your company.

Seminar Outline

1. **Deciding to Use Frame Relay Services**
   - Business requirements
   - Typical Applications
   - Advantages of using frame relay
     - Network performance
     - Cost
     - Network management
     - Flexibility
     - Productivity
   - Disadvantages of using frame relay
     - Single provider
     - Conversion costs

CASE STUDY: This case study will show how a multi-point private line network can be transitioned to frame relay.

2. **Understanding the industry jargon**
   - Frame relay "standards"
   - What a frame is made of
   - Oversubscription
   - Bursting
   - FECN/BECN
   - Discard eligible
   - Difference between cell and frame relay
   - Routing protocols
   - Protocol performance over frame relay

3. **Service Provider Network Infrastructure**
   - Effects of switch locations
   - Backbone speed
   - Redundancy
   - Network platform(s)
   - Network transport

CASE STUDY - This case study will show how a typical "dual star" configuration can be supported by frame relay.

4. **Customer Network Components**
   - Nodes
   - Tail circuits(option for access)
     - UNI
     - NNI
     - Dial-up
     - ISDN
   - Ports - Role of the port
   - PVCs, SVCs and VC
   - CIR
   - CPE: Router/FRAD

5. **Designing and Ordering Your Frame Relay Network**
   - Determine your objectives
   - Gather site information
     - Traffic
     - Equipment
     - Protocols
     - Applications
   - Draw network topology
   - Submit a RFP
   - How to negotiate a contract
   - Transitioning your service to frame relay
     - Common equipment issues
     - Installation intervals
     - A recommended transitioning strategy

CASE STUDY: Frame relay is used to consolidate LAN and SNA traffic onto a single network. We will discuss the CPE considerations and the benefits to using frame relay for this type of network.

6. **Value Added Services**
   - Managed network services
   - Native LAN services
   - Voice over frame relay
   - Frame access to Intranets/Internet

7. **Key differences between the U.S. service providers**
   - Platform
   - Value added services
   - Access options
   - Pricing structure
   - Service guarantees

8. **Future growth of Frame Relay services and your network**
   - Migration path to ATM
   - SVCs
   - Sources for additional services
   - Effects of deregulation of frame relay service
   - Network growth internationally

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IPv6

THE NEXT GENERATION FOR TCP/IP INTERNETWORKS

Directed by: Mark Miller

Seminar Overview

The next generation of Internet Protocol - IPv6 will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities.

Whether you are a network manager, designer or software developer, this seminar will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

Seminar Outline

1. **Defining a new Internet Protocol**
   - The explosive growth of the Internet
   - Depleting the IP address space
   - Technical limitations of IPv4
   - The IETF Response - IPng
   - Proposed solutions:
     - CATNIP - Common Architecture for the Internet
     - TUBA - TCP/UDP over CLNP-Addressed Networks
     - SIPP -Simple Internet Protocol Plus
   - The final result: IP Version 6
   - Testing IPv6- the 6Bone network

2. **The IPv6 Specification**
   - The Benchmark - Operation of IPv4
   - The IPv6 Specification
   - The IPv6 Header
   - The IPv6 Header Format
   - Comparing IPv6 with IPv4
   - Next Header Field Operation
   - Optional Extension Headers
   - Packet Size Issues

3. **Addressing Architecture**
   - The Benchmark - IPv4 Addresses
   - Classless Interdomain Routing (CIDR)
   - Address Options
   - Addressing Architecture
   - Unicast Addresses: Subnet, IEEE 802, Hierarchical, Provider-based
   - Transition Addresses: IPv4 to/from IPv6
   - Anycast and Multicast Addresses
   - Required Addresses for Nodes

4. **Intranetwork Communications**
   - The Benchmark - ICMP for IPv4
   - ICMPv6 Enhancements
   - ICMPv6 Message Formats
   - Error Messages
   - Informational Messages
   - Group Membership Messages
   - The Neighbor Discovery Protocol
   - Neighbor Discovery Message Formats
   - Router Solicitation/Advertisement Messages
   - Neighbor Solicitation/Advertisement Messages
   - Redirect Messages
   - Neighbor Discovery Message Options

5. **Autoconfiguration and Local Area Network Effects**
   - Address Autoconfiguration
   - Neighbor Discovery, Revisited
   - The Autoconfiguration Process
   - IPv6 over Ethernet and Token Ring
   - IPv6 over FDDI
   - IPv6 over WANs

6. **Effects on the Routing Process**
   - IDRP for IPv4 and IPv6
   - RIPng for IPv6
   - OSPF for IPv6

7. **Effects on the Upper Layers**
   - Upper-layer Checksums
   - Maximum Packet Lifetime
   - Maximum Payload Size
   - Domain Name System Updates
   - BSD APIs

8. **Security Architecture**
   - Security Architecture
   - Authentication
   - Encryption
     - Encrypted Packet
     - Tunnel-mode ESP
     - Transport-mode ESP

9. **The Transition - Moving from IPv4 to IPv6**
   - Transition Process
   - Transition Addresses
   - Dual IP Stacks
   - Tunneling

10. **Vendor solutions and implementation plans**
    - Vendor implementation of IPV6 within their products.

11. **References for further study**

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Enterprise Network Management

Understanding SNMP, SNMPv2 and RMON

Directed by: Mark Miller

Seminar Overview

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management.

This one day, information-packed seminar taught by internetworking expert, Mark Miller, will help you understand the elements of an SNMP-based network management system and how to implement SNMP with your internetwork. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork.

Seminar Outline

1. **Understanding Internetwork Management**
   - Defining the System Being Managed
   - Elements of a Network Management System
   - The Agent/Manager Model
   - OSI Network Management and the Five Specific Management functional areas
   - The IEEE Model for LAN/MAN Management
   - The Distributed Management Task Force (DMTF) Model
   - The Internet Model: the SMI, MIB and SNMP
   - The Next Generation: Web-based Enterprise Management (WBEM)
2. **Network Management Implementations**
   - Asante Technologies' IntraSpection
   - Cabletron Systems' SPECTRUM
   - Hewlett Packard's OpenView
   - Tivoli TME 10 Netview
   - Novell NetWare Management System
   - SunSoft's SunNet Manager
3. **The Structure of Management Information**
   - Key elements of Abstract Syntax Notation One (ASN.1): data types, values, modules and macros
   - Transmitting management information - the Basic Encoding Rules
   - Examples of Type-Length-Value Encoding
   - Understanding Object Identifiers (OIDs) and their position on the OID tree
4. **Management Information Bases**
   - Groups and Objects in MIB-II, RFC 1213
   - MIBs for internetworking devices: Hosts, Bridges, etc.
   - MIB support for WANs
   - The Remote Monitoring (RMON) MIBs for Ethernet and token ring LANs
   - RMON vs. RMON2 - key enhancements and upgrades
   - Private Enterprise MIBs
   - Using a MIB complier to incorporate multiple vendor's MIBs into the Network Management System
   - Case Studies: Browsing the System subtree of the Internet-standard MIB
5. **MIBs for Broadband Networks**
   - Comparing service management and device management
   - Customer Network Management
   - The DS1/E1 MIB
   - The DS3/E3 MIB
   - The SONET/SDH MIB
   - The Frame Relay MIBs
   - The SMDS Interface Protocol MIB
   - The ATM MIB
6. **Simple Network Management Protocol**
   - SNMP objectives and operation
   - Object instances
   - The Get, GetNext, Set, GetResponse and Trap Protocol Data Units (PDUs)
   - Using the SNMP PDUs
   - Case Studies: Comparing the Get and GetNext PDUs
7. **Enhancements with SNMP Version 2**
   - SNMPv2 SMI: Data Types and Macros
   - Textual Conventions
   - The SNMPv2 MIB: New MIB Modules
   - New Protocol Operations: The GetBulk, InformRequest and SNMPv2-Trap PDUs
   - Improved Error Processing
   - Support for AppleTalk DDP, Novell IPX and ISO transport protocols
   - Security alternatives: SNMPv2u and SNMPv2*
   - Co-existence of SNMPv1 and SNMPv2
8. **Underlying Transport Protocols**
   - User Datagram Protocol (UDP)
   - Internet Protocol (IP)
   - Address Resolution Protocol (ARP)
   - Local Network Protocols (Ethernet, token ring, FDDI, etc.)
   - Case Studies: Looking at the UDP and IP header formats
9. **Implementing SNMP - Case Studies from Real Networks**
   - Access control using the Community Name and IP address
   - Using Traps to signal network events
   - Confirming Trap Communication
   - Incompatible Private Enterprise MIBs
   - Configuring remote internetworking devices with SNMP

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3/12/97	**Dallas, TX**	Omni Richardson	SNMP031297DL
4/4/97	**Washington, DC**	Sheraton Crystal City	SNMP040497DC
4/9/97	**New York, NY**	Doral Tuscany	SNMP040997NY
4/24/97	**Boston, MA**	The Colonnade	SNMP042497BS
5/14/97	**Atlanta, GA**	Crowne Plaza Ravinia	SNMP051497AT
5/29/97	**Chicago, IL**	Sheraton Gateway Suites/O'Hare	SNMP052997CH
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Directed by: Mark Miller and Carl Shinn

Seminar Overview

Fast Ethernet, ATM, frame relay and SMDS are delivering more efficient and ever-faster communications across enterprise networks. This 3-day seminar will teach you how to design, implement, analyze and manage multiprotocol, multi-operating system internetworks that seamlessly integrate legacy and emerging technologies. Throughout this class, we will make extensive use of network modeling, simulation and analysis tools to demonstrate the techniques that are presented in this seminar.

Seminar Outline

1. **Internetworking Principles and Standards**
   - Open Systems Interconnection Principles
   - OSI Protocols for Internetworking
   - Applying Connectivity Devices to the OSI Model: Repeaters, Bridges, Switches, Routers and Gateways
   - IEEE Project 802
   - LAN Frame Formats: Ethernet, IEEE 802.3, IEEE 802.5
   - IEEE Bridging Standards: Transparent Bridging, Source Routing and Source Routing Transparent Bridging
   - Case Study 1: Ethernet Fragments
   - Case Study 2: Token Ring Initialization
   - Case Study 3: FDDI Station Mgmt.
2. **LAN-to-LAN Internetworking**
   - Designing the LAN-to-LAN Connection: Repeating, Bridging, Switching, or Routing?
   - Network Analysis: The impact of traffic on delay/throughput
   - Connecting Dissimilar LANs
3. **Analog and Digital Data Transmission Facilities for Internetworks**
   - Analog Line Facilities - transmission parameters and conditioning
   - Digital Lines - North American Digital Transmission Hierarchy and framing formats including Fractional T-1
   - Packet Switched Public Data Networks
   - Integrated Services Digital Networks
   - Remote Access to Internetworks
4. X.25 Protocols
   - Packet Switched Public Data Networks
   - X.25 Related Protocols
   - Interfaces to WANs: X.31, X.32 and X.75
   - X.25 Internetworking Examples
5. **Broadband Networking**
   - Broadband Networks and OSI
   - Broadband Transmission Rates & Network Economics
   - Frame Relay: Standards, the User-Network Interface, frame format, congestion control and Internetworking
   - SMDS: Standards, the Subscriber-Network Interface, the SMDS Interface Protocol, PDU formats and Internetworking.
   - ATM: Standards, Interfaces, Virtual Connections and Internetworking
   - Broadband Internetworking Examples
6. **LAN-to-WAN Internetworking**
   - Designing the LAN-WAN Connection: Leased line, Frame Relay, SMDS and ATM Network Configurations
   - Network-specific design issues
   - Case Study 4: Using software tools for network optimization: predicting message transfer delays, protocol overhead, response times and network performance.
7. **TCP/IP and the Internet Protocols**
   - The ARPA Protocol Suite
   - ARPA Network Interface Layer Alternatives: Ethernet, IEEE 802, ARCNET, FDDI & Broadband Networks
   - The ARPA Internet Layer: IP Router Operation, the Internet Protocol (IP) Header, Addresses, and Routing Protocols
   - ARPA Host-to-Host Layer Protocols: Transmission Control Protocol (TCP), and the User Datagram Protocol (UDP)
   - ARPA Higher Layer Protocols
   - The Next Generation for TCP/IP Internetworks: IPv6
   - TCP/IP Internetworking Examples
   - Case Study 5: Diagnosing incompatible terminal types
8. XNS Protocols

   This section will look at the architecture of the Xerox Network Systems (XNS) protocol suite, which is the cornerstone of many other architectures.
9. **Networking Software, Internetworking, and Interoperability**
   - Apple Computer AppleTalk
   - Banyan VINES
   - Novell NetWare 3 and 4
   - Microsoft Windows NT
   - IBM OS/2 LAN Server
   - Case Study 6: Booting AppleTalk stations on a token ring network
   - Case Study 7: VINES internetwork initialization
   - Case Study 8: The Token Ring route discovery process
   - Case Study 9: Using NetWare with source routing bridges
10. **Gateways**
    - BLAST Software
    - Beame & Whiteside
    - Innosoft International
    - Shiva
    - Miramar Systems
    - Attachmate
    - InterConnections
    - Data Interface Systems
    - Andrew
    - Hewlett-Packard
    - FEL Computing
    - Micro-Integration
11. **Implementing the Internetwork**
    - Project concepts: budget, system requirements and architecture
    - The design process
    - Installation and testing
    - System cutover and acceptance
    - On-going support procedures
12. **Managing the Internetwork**
    - The Specific Management Functional Areas
    - Network management using SNMP
    - Remote Monitoring (RMON)
    - Case Study 10: remote router configuration and management
    - Case Study 11: private enterprise MIBs
    - Case Study 12: implementing RMON

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4/8-4/10, 1997	**Chicago, IL**	TBA	LAN2040897CH
4/23-4/25, 1997	**Dallas, TX**	TBA	LAN2042397DL
5/20-5/22, 1997	**New York, NY**	TBA	LAN2052097NY

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Essentials of Networking *and* Data Communications

Technologies and Their Practical Application

Directed by: Ray Horak

Seminar Overview

Essentials of Networking and Data Communications is a dynamic, fast-paced, plain-English, common-sense and thoroughly understandable explanation of current and developing network technologies and communications systems. Acronyms are decoded, technologies are demystified, standards are put in perspective, and regulatory issues and trends are explained. The present and future "Networked World" is set in the context of meaningful and cost-effective business applications.

Seminar Outline

1. INTRODUCTION
   - Date Communications Overview
   - Voice, Data, Video and Image–It's ALL Data
   - Bandwidth, and the Applications which Consume It
   - Broadband Networking as the Solution
   - Computers and Communications Come Together
   - The Information Superhighway, Real Products or Empty Promises?

2. TECHNOLOGY BASICS
   - Transmission Fundamentals
   - Links, Circuits, Trunks & Lines
   - 2-Wire, 4-Wire Circuits
   - Bandwidth
   - Analog vs. Digital Transmission
   - Multiplexing
   - Virtual Circuits
   - Switching Basics
   - Signaling System #7 (SS7)

3. TRANSMISSION BASICS
   - Twisted Pair
   - Microwave
   - Infrared
   - Coaxial Cable
   - Satellite
   - Fiber Optics

4. DATA COMMUNICATIONS BASICS
   - CPE/DTE DCE
   - DSUs/CSUs
   - Modems
   - FEPs
   - Protocol Basics
   - Line Setup/Connectivity
   - Simplex, Half Duplex, Full Duplex
   - Baudot, ASCII, EBCDIC & Unicode
   - Asynchronous vs. Synchronous
   - Bit Sum, VRC & LRC, & CRC
   - Examples–Async, Bisync & SDLC
   - Security
   - Protocol Stacks & Suites
   - OSI Reference Model
   - TCP/IP

5. CONVENTIONAL DATA NETWORKS
   - Evolution of Data Networking
   - DDS
   - Switched 56/64
   - T/E-Carrier
   - ISDN
   - Case Study

6. LAN FUNDAMENTALS
   - LAN Standards and Standards Bodies
   - Media Types
   - Physical and Logical Configurations
   - Broadband vs. Baseband LANs
   - Specific LAN Standards
   - Ethernet
   - FDDI
   - Token Ring
   - Case Study

7. LAN INTERNETWORKING
   - Lan Building Blocks
   - Bridges
   - Hubs
   - Routers
   - Switches
   - LAN Internetworking
   - Remote LAN Access
   - High-Speed LANs
   - FDDI
   - 100VG-AnyLAN
   - Virtual LANs
   - Fast Ethernet
   - ATM
   - Case Study

8. BROADBAND NETWORK INFRASTRUCTURE
   - Emerging Local Loop Technologies
   - ADSL
   - MDSL
   - HDSL
   - Access Methods
   - Sonet/SPH
   - Add/Drop Multiplexing

9. BROADBAND SERVICES AND ACCESS
   - Frame Relay–An Access Standard
   - SMDS–Cell Relay in the MAN
   - ATM–The Ultimate Service Standard
   - Broadband Internetworking
   - Frame Relay-to-ATM
   - SMDS - to-ATM
   - AINs
   - B-ISDN
   - Case Study

10. WIRELESS DATA NETWORKING
    - Frequency Re-Use
    - Access Techniques
    - CDPD
    - Packet Data Networks
    - Wireless LANs and Loops
    - LEOs & MEOs

11. THE INTERNET, THE WEB AND CONVERGENCE
    - Circuits, Packets, Frames & Cells
    - Access Techniques
    - Applications
    - Bandwidth
    - Security
    - Intranets

12. NETWORK CONVERGENCE
    - Driving Forces
    - Defining New Services
    - Terminals, Networks & Applications
    - Telco/Computer/CATV Convergence
    - PCS, CATV, Power Utilities, Internet

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Intranets & the 'Net

Covering: Internet Technologies and Services
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Briefs

■ **Inex Corp.** *has started shipping Inex Entrepreneur for Windows, a $495 software package intended to let small business owners set up* **electronic storefronts** *on the World-Wide Web without having to maintain a dedicated Internet link.*

Inex: (416) 214-2250.

■ *Seattle-based software provider* **iCat Corp.** *said it is now beta-testing its iCat Electronic Commerce Suite Version 3.0, which adds support for the* **Open Database Connectivity standard** *and browser-based data and catalog management.*

iCat: (206) 623-0977.

■ **Open Market, Inc.** *has received permission from the U.S. Department of Commerce to export a* **128-bit version of its electronic commerce software,** *OM-Transact, with 128-bit Secure Sockets Layer encryption. The encryption is used by merchants and buyers that communicate with OM-Transact using a 128-bit Web browser.*

■ **Management Science Associates, Inc.** *said its @media division has developed electronic data interchange software for advertising agencies. The EDI software, designed according to the EDI cable committee, will first be used by advertising agency Leo Burnett Company, Inc. for exchanging contract information among agencies and the cable networks.*

Management Science Associates: (412) 362-2000.

ISP, user concerns slow adoption of IP multicast

ISPs fear multicast traffic could overrun networks.

By Chris Nerney
and Denise Pappalardo

You could call John Curran an IP Multicast supporter.

BBN Planet's chief technology officer recently served as a panelist at the IP Multicast Summit, an event sponsored by an industry consortium trying to hasten full deployment of the technology.

And BBN Planet, under Curran's direction, is offering IP Multicast on a small number of routers.

But the Internet service provider is not providing customer support for IP Multicast. In addition, Curran said the Cambridge, Mass.-based company "is not willing to jeopardize the reliability of our backbone to roll [IP Multicast] out as a full service yet."

To a large degree, that sums up the challenge facing members of the IP Multicast Initiative (IPMI), the group that sponsored the recent multicast summit.

Many end users and ISPs are enthusiastic about the technology, but they are not ready to fully deploy it across their systems because they fear disruption of their networks.

ISPs, which make their money by enticing customers to use bandwidth, also are concerned that a bandwidth-reducing technology will cut into their profits.

IP Multicast is designed to distribute information over a network to multiple users. While unicasting — the traditional method of sending information — creates a point-to-point datastream between the sender and each receiver, multicast sends a single stream of data that can be accessed by any recipient (see graphic).

Supporters of IP Multicast say it reduces bandwidth usage, eases the strain on servers and improves the quality of transmissions, especially bandwidth-hungry multimedia applications such as video and audio.

IPMI members say IP Multicast can be used now, yet analysts are more cautious. "While multicast technology offers an attractive method for the newly anointed Internet push technologies, we do not expect widespread adoption until 1998 or 1999," concluded a recent study by META Group, Inc. in Stamford, Conn.

According to Judy Estrin, president of IP Multicast vendor Precept Software, Inc. and a founder of IPMI, more ISPs must provide access to the multicast backbone (MBone) for multicast to become ubiquitous across the Internet.

Created in 1992, the MBone is an Internet Engineering Task Force-run virtual network layer on top of the physical Internet that supports routing of IP Multicast traffic.

ISPs, however, say they face technological and economic impediments to their adoption of IP Multicast protocols.

"Right now, when we exchange traffic between our network and other providers' [networks], the amounts of traffic sent and received are similar," Curran said. Multicast, he said, changes that equation. Hundreds of BBN users could subscribe to a datastream or multicast session, creating a large influx of traffic on BBN's network, he said.

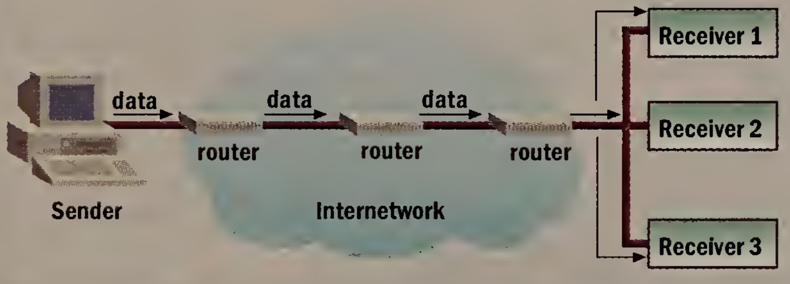
"Who should pay for that bandwidth utilization?" Curran asked.

This is one of the areas that has not been worked out among service providers. "Should the listener be charged, or should the person who origininates the session pay at the application? Should users pay different rates depending on the applications they use? The pricing model has not been established yet," Curran said.

Customers have their own concerns. Justin Pietsch, a senior computer specialist at the University of Washington, said he and other networking staffers at the Seattle-based institution have been eager to deploy IP Multicast campuswide but are still trying to work out router problems. ■

HOW IP MULTICAST WORKS

Multicast allows one stream of data to be routed to multiple receivers. With the unicast method, data is sent over the network multiple times, from the sender to individual receivers.



Ukiah unveils 'hybrid' net firewall

By Chris Nerney
Campbell, Calif.

Security vendor Ukiah Software, Inc. today announced a firewall designed to protect hybrid TCP/IP and IPX networks.

NetRoad FireWall integrates the capabilities of an IPX/IP gateway and an IP firewall, eliminating the need for a separate IP firewall and IPX/IP gateway, according to Gordon Smith, Ukiah's vice president of sales and marketing.

Smith said NetRoad FireWall is integrated with Novell Directory Services (NDS) and can run on Novell, Inc.'s NetWare 4.X and IntranetWare platform.

The product's security features include packet filtering, as well as a circuit-level and an application-level gateway. These features address a full range of network security threats from low-level IP spoofing attacks to application-level attacks, Smith said.

While one analyst said the company's claim to have the first firewall to protect TCP/IP and IPX networks is indeed accurate, she questioned the demand for such a product.

"If there's such a need for it, why hasn't this been done before?" said Erica Rugullies of Boston-based Hurwitz Group, Inc.

Smith said there has not been the burning urgency to connect IPX to the Internet, and until recently, Novell networks have been mostly NetWare-only. That is changing, he said.

He also said storage of user names and passwords in NDS, outside the reach of the firewall administrator's control, pose no security problem.

"I can't say I view this as a weakness," Smith said. "NDS has been well proven over a number of years. Its security in terms of administrators' access has not been found wanting."

PROFILE: UKIAH SOFTWARE, INC.

Founded:	1995 by Naveen Bisht, Kailash Joshi and Sanjay Sawhney
Headquarters:	Campbell, Calif.
Financials:	Privately held
Employees:	21
Products:	NetRoad FireWall and FireWare; Information Server and News Server

FireWall 4.X is available now. The product is priced between $2,995 for 10 users and $14,995 for unlimited users.

For more information, contact Ukiah Software at (408) 369-2890.

Network World Senior Washington Correspondent Ellen Messmer contributed to this story.

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'NET INSIDER

Is online discussion democracy?

I have been watching the iahc-discuss mailing list for the past few months. This is the list that was set up to discuss the work of the International Ad Hoc Committee, which is looking at creating new Internet domains (subscription information at www. iahc.org). Observing the way the list works provides an interesting window on a mechanism that some people see as the future of democracy.

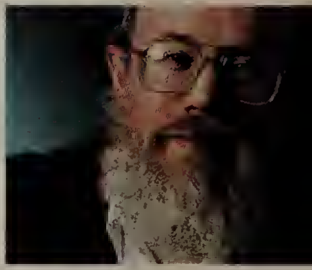
More than 1,200 people have subscribed to the list at one time or another since it started on Nov. 16, 1996. The number of simultaneous subscribers has grown from about 320 at the start to 413.

This has been a busy list, with more than 5,300 messages exchanged. About 278 individuals have posted at least one message so far. This represents more than 20% of the list membership and is a far higher fraction of those that stayed subscribed to the list for a significant length of time. The total is also a greater percentage of the members participating in a discussion than I would expect to find in just about any large face-to-face meeting.

Given the numbers, it would seem that an open online discussion might be empowering for many of those that might not otherwise express their views on a topic. But this is quite misleading.

The distribution of people posting messages has been unbalanced. Five people have been responsible for more than 28% of the postings, and more than half of the messages came from a dozen individuals — 1% of the list membership have produced the majority of the traffic. Note that posting volume should not be confused with the quality of information.

A number of pundits, and not a few politicians, have described a future in which the country will be run using some form of electronic town hall, perhaps with instant issue-specific electronic voting. Anyone who feels that this would result in democracy should take a look at the archives of the iahc-discuss list.



Scott Bradner

Paul Hoffman, someone with far more political science in his background than I have (i.e., some), said, "Democracy is about the hard task of acting based on less than complete agreement, but is not much about participatory debate. The iahc-discuss mailing list was only about debate, and thus is a bad example of democracy."

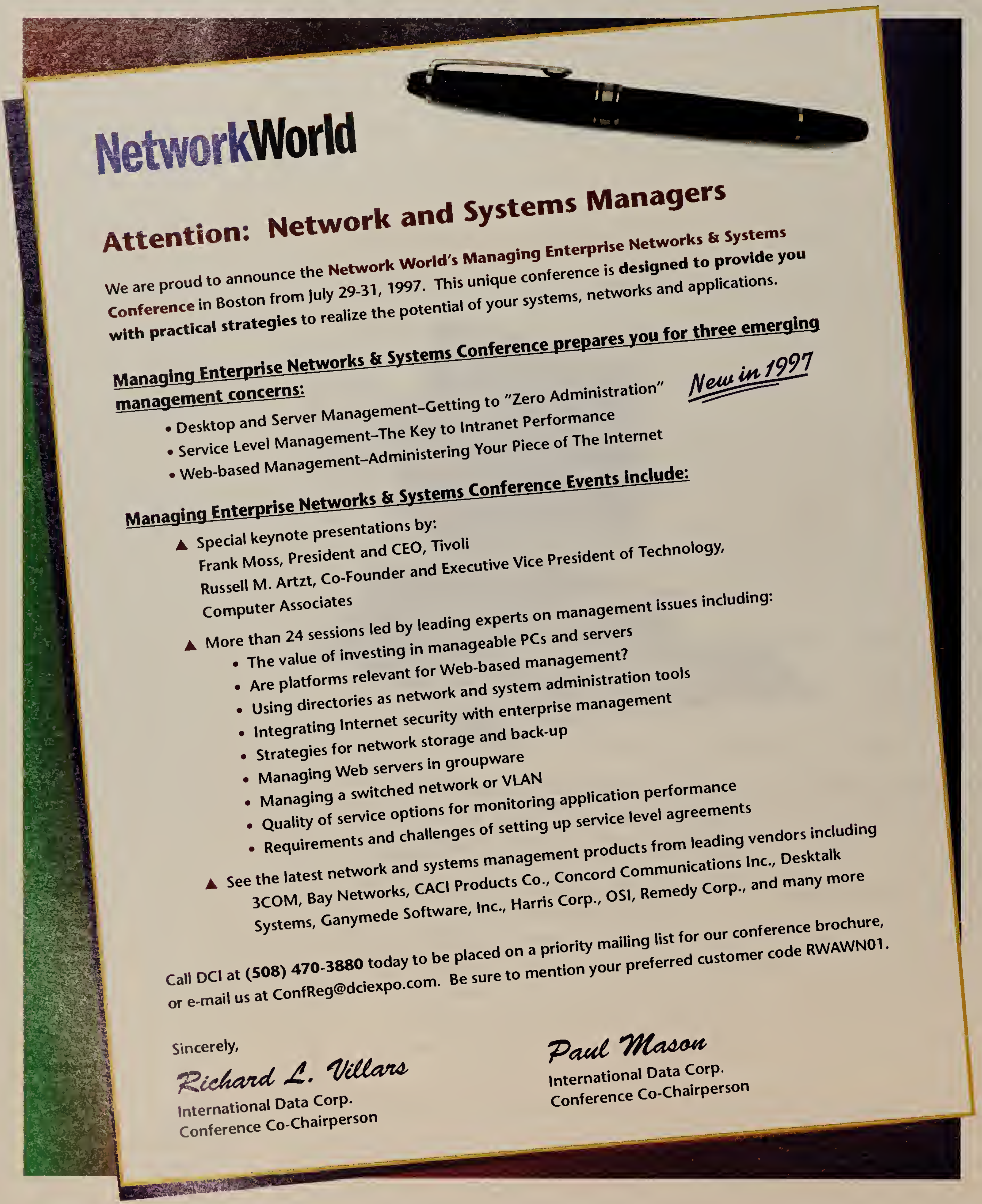
Clearly, debate is necessary in a democracy, but historically, debates are moderated in some way and have been used to try to build consensus. Unfettered debates can foster demagoguery, disinterest and disgust, all at the same time.

Introducing new technology into the arena of democracy has often been hard, from constant opinion polls to TV ads. Figuring out how to incorporate online discussions will be just as difficult. Defining electronic communities, getting them to agree on the rules of the game, figuring out how to correct misinformation and interpreting consensus will all be hard.

The IETF has accomplished some of this on working group lists but following the activity on iahc-discuss does not make it look any easier in the general case.

Disclaimer: A Harvard faculty meeting is the ultimate town hall meeting (with a tendency to use words one has to look up) but is still face-to-face; opinions on the use of electronic democracy are my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.



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Java development tools speed ahead on the RAD fast track

By Ellen Messmer

There are now so many products called Java development tools out there, picking one can be as confusing as buying a car — so many categories, so many brands.

The Java rapid-application development (RAD) tools are like a sporty compact with an automatic shift — easy to drive but maybe can't carry as much as you'd like. These are the newer tools on the market, designed to give corporate application developers or even nonprogrammers a way to generate Java code through drag-and-drop simplicity.

At the other end, expensive Integrated Development Environment (IDE) tools are like long-haul trailers — impressive, powerful, takes nerve to drive one, but do you really need the capacity?

"The next version of Visual Cafe will support 'Beans.'"

Allen Bannon, director of developer relations for Symantec's Internet tools group, referring to SunSoft's Java component interoperability spec

And then there are the Java component vendors. Using the auto analogy, they're the ones selling tires or specialty glass or engine parts. There are about 80 of these — including Rogue Wave Software, Inc., KL Group, OpenConnect Systems, Inc. and MicroLine, Inc. — selling all different kinds of Java component libraries, such as charting classes and tree structures, to work with RAD or IDE tools.

Until the world of Java moves in earnest to the industry standard for component interoperability — called the Java Beans specification promoted by Sun Microsystems, Inc. as part of its Java Developers' Kit 1.1 finalized just last week you'll have to make sure the Java components you buy are really designed to work with the tools you select.

The new RAD tools let users generate Java code by pointing and clicking with little or no understanding of Java programming. RAD tools don't often have sophisticated debuggers, says Evan Quinn, director of Internet software at Framingham, Mass.-based International Data Corp.

Harder to categorize

With new-model Java tools expected out this spring, it will be harder than ever to categorize anything neatly, Quinn added.

There are already a handful of products, such as Wallop Software, Inc.'s Build-IT for the Enterprise or WebMethods, Inc.'s Web interface Toolkit, that let you combine Java along with HTML, sound, ActiveX, JavaScript, Perl script and a kitchen sink of other components.

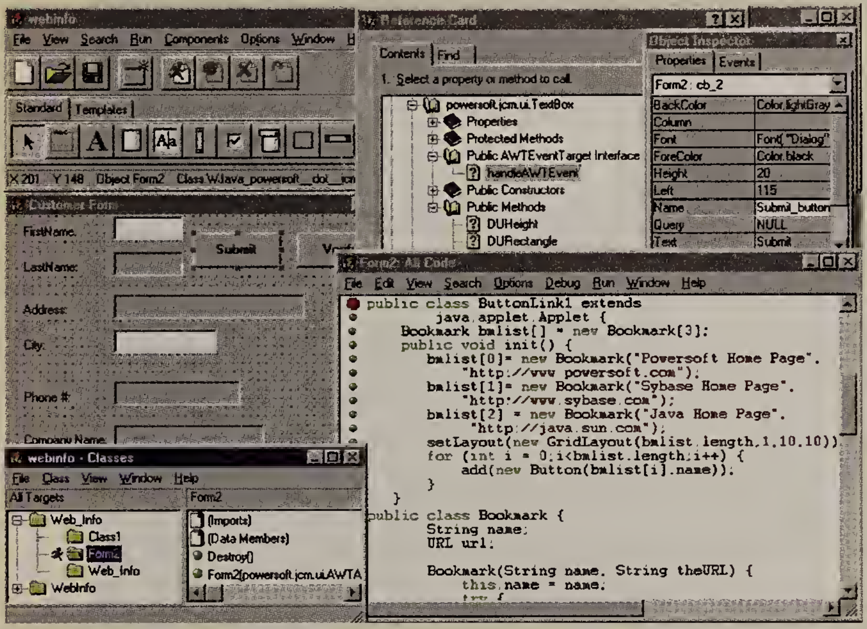
For example, Information Builders, Inc. has an application development tool called Cactus that lets you combine HTML, Java, Common Gateway Interface (CGI) and third-generation programming languages without having to understand underlying coding techniques.

"There is a trend in large corporations toward Java, but it's not as a replacement for HTML, but for Perl and CGI," says Rob Bolt, Wallop chair and chief executive officer. "These scripts are slow and cumbersome when dealing with volume on a Web site."

"You still need to do some heavy Java programming on your own," says Maureen Mahoney, a computer specialist working on an intranet Java application.

As when visiting a car showroom, buyers would do well not to be blinded by the marketing hype but instead ask hard questions about Java tools.

Does the tool allow you to link to databases via the Java Database Connectivity (JDBC) or proprietary database drivers? Does it let you set up a Java-based application server to take the processing off the Web server?



BackColor	Color.lightGray
Column	
Font	Font("Dialog"
ForeColor	Color.black
Height	20
Left	115
Name	Submit_button
Query	NULL
Text	Submit

```
public class ButtonLink1 extends
      java.applet.Applet {
   Bookmark bmlist[] = new Bookmark[3];
   public void init() {
      bmlist[0]= new Bookmark("Powersoft Home Page",
         "http://www.powersoft.com");
      bmlist[1]= new Bookmark("Sybase Home Page",
         "http://www.sybase.com");
      bmlist[2] = new Bookmark("Java Home Page",
         "http://java.sun.com");
      setLayout(new GridLayout(bmlist.length,1,10,10));
      for (int i = 0;i<bmlist.length;i++) {
         add(new Button(bmlist[i].name));
      }
   }
public class Bookmark {
      String name;
      URL url;

      Bookmark(String name, String theURL) {
         this.name = name;
```

Sybase's *PowerSoft division is working on a RAD tool code-named Java Assisted Takeoff — or Jato, for short.*

Does it let you program Microsoft Corp.'s ActiveX Controls in Java, however much that may alarm Java purists?

Sun, the creator of the "write once, run anywhere" Java language, hopes you won't even think of it since use of ActiveX in Java would make your application platform-dependent — and help out its chief rival, Microsoft.

Some corporations may want to make use of their Windows-based legacy systems through ActiveX, and a number of Java tools developers are getting ready for it.

Microsoft, Sun, Symantec Corp., Roaster Technologies, Inc., Silicon Graphics, Inc. and MetroWerks, Inc., among others, have raced their big-wheel rigs to try and win the IDE market.

According to Quinn, Symantec's Cafe product has clearly won the early IDE race in terms of market share, trailed by Microsoft's Visual J++ and Sun's Java Workshop.

But more IDE tools are on the way, such as IBM's Visual Age for Java and NetRexx, which has Java scripting syntax derived from IBM's Rexx scripting language.

But the real emphasis now appears to be on the RAD tools, such as Symantec's Visual Cafe, a drag-and-drop version of Cafe just out for Macintosh and Windows last month. At the same time, Gradient Technologies, Inc. unveiled its RAD Java entry, WebCrusader 2.0.

Symantec's director of developer relations and Internet tools group, Allen Bannon, said the new Visual Cafe RAD tool Symantec has out does not support Java Beans, but the company will be headed in that direction after JDK 1.1 is finalized, probably next month.

To underscore Symantec's commitment to Java, Bannon emphasized that Symantec has "seven teams of developers" working on RAD tools to "bring Java to the masses."

For example, the Santa Clara, Calif.-based ObjectShare division of ParcPlace Digitalk, Inc, for example, has put out a beta version of a product called Parts for Java.

According to Maureen Mahoney, a computer specialist working on an intranet Java application, the Parts tool is useful for generating graphical user interface screens through simple drag and drop.

"You still need to do some heavy Java programming on your own," Mahoney says.

Tool wave

Other new Java tools are out to find their own niche. OpenConnect has OpenVista, a tool to generate front-end Java applets as graphical interface screens on the fly when used with its SNA connectivity product, OC:WebConnect.

Borland International, Inc. will be directly competing in the RAD market later this spring with its JBuilder product. Sybase, Inc.'s PowerSoft division is preparing for RAD entry with a product code-named Jato, or Java-Assisted Takeoff.

"With Jato, you can integrate ActiveX and Java," says Tina Pitts, technical marketing specialist at Sybase. "You can see ActiveX in a Java form."

Any Java tools should let you write applets that run in a Java-enabled browser, but Jato is also supposed to let you write servlets, Sun's server-side applets that can be uploaded to run together on a Java server.

Sun wouldn't mind winning over the masses, either. Joe Keller, SunSoft, Inc. director of product marketing, says Sun plans to have new Beans-compliant version of Java Workshop out in beta next month.

And for the RAD market, Sun is fielding a tool called Studio it claims is ultra-simple for the Java-challenged to use.

Go online for an expanded version of this story and articles about Java development.

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Start-up Apptivity Corp. this month came out with a tool kit called Apptivity Developer that lets you set up a Java-based application server that takes heavy-duty work such as forms processing off the Web server and connect to back-end databases via JDBC. ■

Oracle7 on NT

Features	Oracle7	Microsoft SQL Server
Runs from Laptop to Data Center	YES	NO
WebServer/Database Integration	YES	NO
Cluster Support (Fault Tolerant Parallel Server)	YES	NO
Multiprocessor Scalability	From 1 to 400+ processors	From 1 to 8 processors
Parallel Query, Load, Index	YES	NO
Star Queries	YES	NO
Bitmap Indexes	YES	NO
Integrated Replication	YES	NO
Row-level Locking	YES	NO
OLAP/Multidimensional Integration	YES	NO
Video Storage and Playback	YES	NO
Text Storage and Search	YES	NO
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I have been using Cheyenne Software, Inc.'s ARCserve 4.02 backup software since 1991, and I love it. But since I upgraded my backbone to 100Base-T and applied some NetWare patches so I could run the faster Ethernet technology as well as allow my Novell, Inc. GroupWise mail gateways to run IP on a 10Base-T card, ARCserve 4.02 has stopped seeing the tape drives. SBackup works fine with the drives that ARCserve can't see anymore.

Cheyenne hasn't upgraded 4.02 since 1994. Do you have any suggestions on how to get around this problem?

Fred Wagner, IS manager, Richards, Watson & Gershon, Los Angeles

Cheyenne quietly offers ARCserve 4.02N, a release primarily meant to help users that have migrated to NetWare 4.X but don't want to upgrade their backup software. You might find this update, available from Cheyenne technical support, somewhat helpful.

You also should check with the maker of the SCSI controller to which you have your tape backup drive connected to see if it has updated the driver.

If your tape drive is on a dedicated controller, try using an Adaptec, Inc. SCSI controller and talking to the tape drive via the ASPI Manager driver, which uses API calls.

The advantage of the hardware direct driver is supposed to be speed, but in your case, the potential sacrifice in backup speed may be an acceptable trade-off if the tape drive works again.

Alternatively, you might try a Buslogic driver.

Finally, given the patches you have applied, make sure to apply the "SET RESERVED BUFFERS BELOW 16 MEG = 200" statement in your start-up.ncf file. If this statement is not put to the maximum setting, it can cause the tape drive to "disappear."

Three-prong security provides key to virtual private networking

Interoperability and support for dial-up and LAN-to-LAN connections also are a consideration.

By Alex Henthorn

Network managers are becoming increasingly interested in the idea of using a public network such as the Internet in place of private lines to transport internal corporate data such as intranet documents, groupware communications and E-mail.

Quite simply, this type of virtual private networking (VPN) provides a relatively inexpensive way to connect telecommuters, mobile workers and remote sites to a home office LAN.

By using the Internet to transport data, companies can save up to 50% of the cost of operating a traditional leased private network, according to a 1996 U.S. computer study commissioned by Sun Microsystems, Inc.

While interest in VPN is growing, actual deployment is low. This is because VPN technologies are relatively immature, and many network managers don't understand how these networks should work.

Security is first and foremost among the important design issues for VPN. Private data that is transmitted over the Internet must be protected in order to keep it from being interfered with or intercepted.

Three types of data security come into play for VPN: encryption, which is the function of scrambling data so only the intended receiver can read it; authentication, which is the function of positively identifying the sender to the receiver; and integrity, which is the function of ensuring the data has not been changed in transit. Without all three security functions, a VPN solution is incomplete.

A key to VPN

It is impossible to understand VPN security without discussing encryption keys and their impact on a VPN's growth potential. To understand encryption, picture Person A feeding a private message for Person B into a scrambling machine purchased off a store shelf. Because anyone can buy a similar scrambler, simply feeding the private message into the scrambler won't provide any real security. However, if the private message is combined with a predetermined shared secret code that only the two parties know, then the message can be scrambled by Person A and only read by Person B.

This is how data encryption works in VPN. A key is a shared secret that provides the actual security in the scrambling process. Both parties must know the key, and its use must be managed with care.

If intruders are trying to discover the content of private messages, and A and B continue to use the same key over and over again, it's only a matter of time before the intruders will be able to use their knowledge of the scrambling machine, and of common phrase and word occurrences, to figure out the key. At that point, the private messages are no longer secure.

In short, if A and B are smart, they will figure out a way to keep changing their shared secret, and somehow notify each other of the changes to continue effective scrambled communications. Data encryption follows this same principle — the keys used in encryption must be updated and passed to both communicating parties at regular intervals to retain the security of the whole system.

To complete this analogy, if A and B add 100 more parties to their "virtual private" communication system, they will need a separate system just to manage passing keys out to every pair of communicators in the group. The technology that automates this key-passing function in a VPN is called key management.

Although it is — in technical terms — much more complex than this illustration permits, the main point to remember is without an automatic key management system, it is impossible to use VPN for more than a few remote users or offices at a time.

Since the goal of VPN will be to eliminate as many unnecessary private network connections as possible, key management is rather important.

Flexible configurations

Another important issue to consider when evaluating VPN is design flexibility. While many organizations will start by using VPN to outsource telecommuters or remote offices, most organizations will eventually want to do both. This means the VPN solution of choice should have dial-up and LAN-to-LAN capabilities.

Finally, an ever-present and crucial design issue to consider is interoperability. Open standards from a group such as the Internet Engineering Task Force, with broad vendor support, are crucial. This is because VPN will encompass the myriad remote access and security devices already deployed.

VPN promises to be a practical new application for the Internet, with measurable bottom-line return on investment in the form of cost savings compared with building private networks.

Next week's "Technology Update" will explore some VPN protocols in light of these design criteria.

Henthorn is security product manager at Livingston Enterprises, Inc., a remote access vendor in Pleasanton, Calif. He can be reached by phone at (510) 737-2156 or via the Internet at alex@livingston.com.

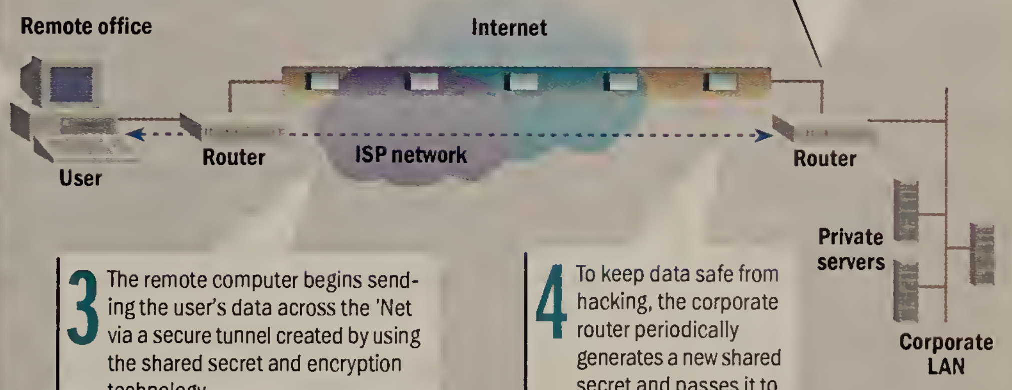
HOW IT WORKS

VPN secures data across the 'Net

Virtual private networking (VPN) requires the use of various security mechanisms to ensure that data being transported over the Internet cannot be interfered with or intercepted.

1 A remote user logs on to an Internet service provider's network and initiates a TCP/IP session with the corporate router. The user employs public key encryption technology to place an identifier in each packet sent. The individual also sends the shared secret needed to encrypt packets received.

2 The corporate router uses public key encryption technology to authenticate the packets it receives. If approved, the router sends the user the shared secret it needs to receive data.



3 The remote computer begins sending the user's data across the 'Net via a secure tunnel created by using the shared secret and encryption technology.

4 To keep data safe from hacking, the corporate router periodically generates a new shared secret and passes it to the user.

EDITORIAL *insights*

Mediasaurus or trusted source?

Anyone who has read Michael Crichton's books — including his latest one, *Airframe* — is familiar with his open disdain of the media. We, the press, are shortsighted, misguided and will do anything to beat our competitors to that "big story" (usually a story high on intrigue and light on details and perspective).

In an article in *Wired*, back when Crichton put it more bluntly, he called us dinosaurs that will be rendered extinct by the online world (good reading — give it a whirl at www.wired.com/wired/1.4/features/mediasaurus.html). When the population at large can directly access unfiltered information, he argues, it will no longer put up with the media's subjective twisting of the truth.

Interesting notion, and one that has caused this and every other print journalist some sleepless nights.

But one thing Crichton overlooks is the money factor. It costs huge amounts of money to circulate information in print. While that isn't a good thing, it extends to you, the reader, some confidence.

Because the newspaper business is high cost, we wouldn't risk it all by throwing over the general bylaws of good journalism. We strain to be objective, accurate and fair. If we are not, readership and advertising support plummets. In other words, we croak if the public believes we are no longer in pursuit of the truth.

Now compare that to simply surfing the Web for information. If you do a search on, say, TWA Flight 800, what is your confidence level in the information you will find?

Here's a site for you — www.whatshotin.com/sol10a.mid: "We have the UNDERGROUND NEWS about TWA 800 and the Oklahoma City bombing that the government and media are hiding. Posted on this site are FEDERAL DOCUMENTS about TWA 800, the Oklahoma bombing and Rabin's assassination that the GOVERNMENT doesn't want you to see."

Sounds interesting. But who is funding this site? What bylaws govern its rules of publishing? If none of it is true, what does the disseminator of the information stand to lose?

Because the cost of publishing on the Web is next to nill compared to the cost of print publishing, anyone and everyone can do it. It is hard, if not next to impossible, to ascertain the credentials of these new sources of "information."

The Web's chief advantage — the ability to easily disseminate information — is one of its chief liabilities. It will be hard for independent sources of information to win the confidence of the public. For now, anyway, I believe Crichton's prediction of print's imminent demise is wrong, and I'm sleeping better.

John Dix, editor jdix@nww.com

On Security • Winn Schwartau

Defensive surfing: Catching hackers before they catch you

Firewalls on the front door. Cryptography on the back door. Passwords replaced by security tokens. Employee education and awareness. Corporate policy. You think you've done everything we info-security experts have been preaching.

And yet, there's still that little nagging feeling: Are you really safe from marauding hackers and industrial spies?

Statistics show that 30% to 60% of computer crimes involve company insiders. So what about them? Human resources will tell you that employee rights and privacy laws may prevent you from scouring your own networks in search of ne'er-do-well, disgruntled or technically ignorant staff. But there is a way.

Open Source Monitoring, a new corporate intelligence tool offered by companies such as Science Applications International Corp. (SAIC) and the National Computer Security Association (NCSA), gives you a leg up on the bad guys by keeping tabs on their actions.

Let's say you've already been hit by hackers or are worried about being a victim in the future. The NCSA's IS/RECON group will search the Web, Usenet and underground bulletin board systems using your company's name and other key words to find out if you're being actively targeted by hacker types.

For example, say your company is being trashed on a hacker list server such as Cypherpunks or any of the myriad hacker/phreak discussion groups all over the 'Net. The NCSA will tell you what it found, and you can take any precautionary steps you deem appropriate.

In addition to providing alert monitoring and biweekly reports, the NCSA will give you access to its huge database so you can do your own searching, if you so choose. (For more information, send E-mail to dkennedy@ncsa.com.)

SAIC's Center for Information Protection (CIP) uses its computer horsepower to deliver threat assessments to customers. CIP provides FLASH reports if attacks are imminent and delivers the reports by E-mail, voice, fax or courier. Less critical alerts are delivered on a 24-hour basis. Each client also receives an extensive quarterly custom report. (For more information, send E-mail to osm@cip.saic.com.)

Both companies take the process even further, though, and examine not only external threats, but also internal ones. What if an employee is posting inappropriate information about your company, or about illegal drugs, extremist activities or other questionable things?

Even seemingly innocent postings are increasingly frowned on by many companies. Employees may be accidentally giving away company information such as the latest operating system patches, or which mainframe talks to which system over such and such a connection between City A and City B. Open Source Monitoring helps you short-circuit those kinds of leaks.

How do two high-profile antihacker companies track hackers without getting caught or calling too much attention to themselves? The NCSA uses a separate Internet service provider for its IS/RECON group, as well as a caller-ID blocked dial-up telephone service that has no relation to the NCSA.

SAIC has individuals with no apparent connection to the company who pay for different ISPs, so no one can trace who is actually behind the keyboard.

So if you want to take a bigger, broader look at your company's security, investigate Open Source Monitoring and see yourself as the world sees you. One security manager told me he saw his high-tech company as an obvious target. But, he pointed out, a ketchup company doesn't have much to worry about. That says a lot for keeping a low profile when a high profile is not needed. It might just be that silence on the 'Net is your best defense.

Schwartau is chief executive officer of Interpact, Inc., an international security consulting firm, and managing director of www.infowar.com and www.infosec.com. He can be reached at (813) 393-6600 or via the Internet at winn@infowar.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Can the spam

I found Wayne Spivak's opinion column defending spam (Jan. 27, page 40) to be more than a little self-serving since he obviously stands to benefit financiall from open spamming.

There are also a couple of holes in hi argument that a user only has to press th delete key to avoid reading the message.

First, many E-mail applications and browsers automatically download waitir mail to the user's desktop, thus wasting the user's bandwidth and online time with messages he or she does not want.

Second, broadcast spam takes up bandwidth on the 'Net and unnecessari wastes space on 'Net service provider

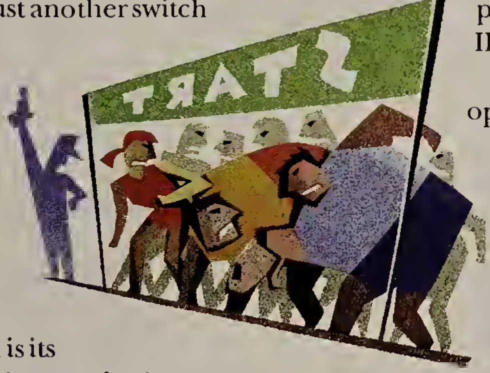
Infrastructure Insights • *Mary Petrosky*

Sizing up the Gigabit Ethernet field

The Gigabit Ethernet standard won't be fully defined until midsummer. But that hasn't stopped a handful of start-up companies from introducing products in an attempt to jump-start the market and take the lead in what promises to be a crowded field (*NW*, Feb. 17, page 1).

This first wave of Gigabit Ethernet products covers virtually every part of your network — from network adapters and switches designed to interconnect your server farm, to switches for the wiring closet, to multilayer switches for your backbone. These switches sport a variety of interesting proprietary and standards-based features.

For example, GigaLabs, Inc. and Alteon Networks, Inc. have developed proprietary schemes for increasing throughput among switches and computers in an effort to make as much bandwidth as possible available to end systems. By targeting server farms, both vendors are trying to be more than just another switch maker.



GigaLabs has leveraged its background as a maker of High Performance Parallel Interface (HPPI)-based switches for supercomputers to build an 18G bit/sec switch that can be configured with eight Gigabit Ethernet ports or GigaPipe ports. Based on the company's HPPI-based I/O switching technology, a GigaPipe port connects to a computer's I/O subsystem and delivers a purported 2G bit/sec of throughput.

Part of Alteon's solution to the server throughput problem is its Jumbo Frames feature, which its Gigabit Ethernet switches and network adapters support. Jumbo Frames bumps up the maximum Ethernet frame size from 1,518 bytes to 9,000 bytes. Using oversized packets to communicate between a switch and a server or other high-end computer reduces the amount of packet processing the computer has to perform, freeing up CPU cycles for more productive work — such as application processing.

You may shy away from these technologies simply because they're proprietary. But try to evaluate them with an open mind, since gleaning a full gigabit's worth of throughput from a computer will require innovative approaches.

On the standards front, a number of vendors — including Alteon, Foundry Networks, Inc. (formerly StarRidge Networks, Inc.) and Rapid City Communications, Inc. — plan to support the IEEE 802.1q virtual LAN tagging scheme. Although the format of the 802.1q tags has been determined, the specification is not yet complete. Consequently, support for VLAN tags won't automatically translate to a common VLAN scheme across switches from multiple vendors. But it is a major step in the right direction.

Foundry and Rapid City, which are both building multilayer Gigabit Ethernet switches, also support multicasting with the Internet Group Multicasting Protocol and plan to support the Resource Reservation Protocol. If you're committed to Ethernet and the IP suite of protocols, and want multimedia capability such as videoconferencing to the desktop, take a hard look at multilayer switches. Since many multimedia capabilities are being defined as part of the IP suite of protocols, you'll need IP-level intelligence in all devices — even those in the wiring closet — to assure end-to-end quality-of-service support.

Because their strategies and product development approaches are similar, Foundry and Rapid City will be competing head-to-head. Both have developed multilayer Gigabit Ethernet switches capable of forwarding millions of packets per second based on the media access control address or the IP address.

Both companies will have versions of their switches that can easily operate as high-performance, IP-only routers that off-load IP traffic from multiprotocol backbone routers. You should consider these multilayer switches as a viable alternative to more elaborate short-cut routing or IP switching schemes.

In addition, both companies have designed their switches around a shared-memory architecture. This approach offers better multicasting support than the crossbar switch design GigaLabs and some other vendors use.

With Gigabit Ethernet switches becoming available, you should consider whether you need such switches and where you might deploy them. Bear in mind that products that ship over the next few months will be prestandard.

Although the core aspects of the Gigabit Ethernet specification have been nailed down, various technical details — including the optical physical layer interface specifications — still need to be defined.

Consequently, any prestandard Gigabit Ethernet products may require hardware changes to be brought into compliance with the final standard. If you're interested in Gigabit Ethernet today, plan to use these early products in pilots or test environments. And be sure to get a commitment from your vendor that any prestandard equipment you buy will be upgraded at no cost to you.

Petrosky is a senior analyst with The Burton Group, an information services firm that provides in-depth technology analysis. She can be reached at her San Mateo, Calif., office at (415) 572-0560 or via the Internet at petrosky@tbg.com.

servers.

Instead of forcing users to write or subscribe to some service to prevent unwanted E-mail, why not require users who don't mind getting commercial spam to subscribe to a list? This would have the added benefit of ensuring advertisers that their commercial missives are not likely to provoke unbridled rage from the recipients.

When you exercise your right to free speech, you must be careful not to infringe on my right not to listen.

Paul Miller
Project manager
Rediform
Dallas

What's in a name?

I completely agree with Mark Gibbs' column "An intranet is an intranet, but is it also an extranet?" (Jan. 27, page 66).

I cringe when people use the term "intranet." It's just Web technology on an internal or private network! Why must we have a pet phrase or keyword for every concept?

What about "Private Internet?" Or simply "Private TCP/IP network?"

Things have gone too far. People think the Web is something other than the Internet and that an intranet is something different still. And the media only make it worse.

Let's see, an "extranet" is used to interconnect different networks. Gee, isn't that what "Internet" means?

Scott Hutchinson
Personal computer coordinator
Office of the Sheriff
Contra Costa County, Calif.

I enjoyed Mark Gibbs' column on the negative aspects of vendors' inventing specious terms such as "extranets" when existing words already fill the intended meaning niche. This is, indeed, just plain silly.

This sort of behavior by industry vendors and publication pundits just increases the dislike that many senior technologists feel toward marketing and management types who make our lives unnecessarily complex in their rush toward some ephemeral status advantage over their peers.

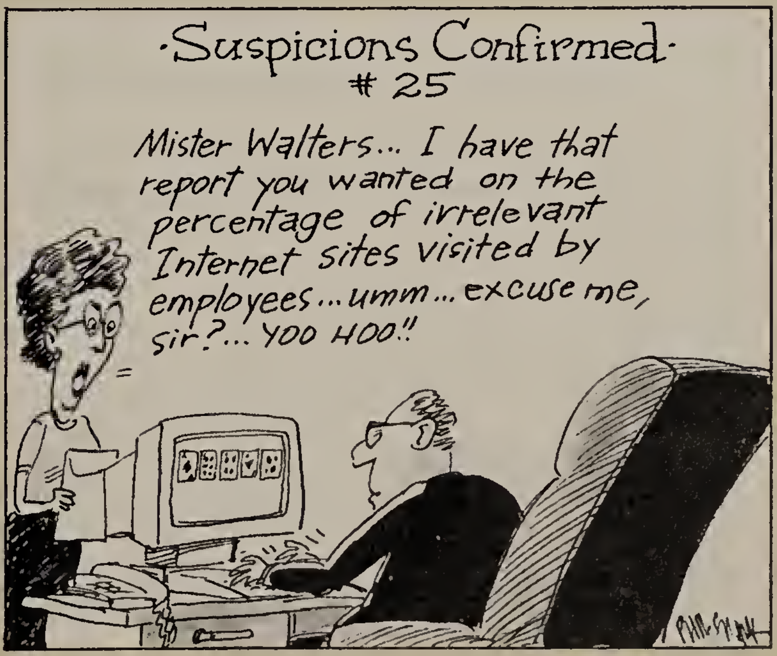
Bruce Hilditch
Senior technology architect
Allina Health System
Minneapolis

I was very disturbed after reading Mark Gibbs' column on extranets. Imagine this scenario: Microsoft hops on the bandwagon for this "new" technology and decides that everyone needs a new browser to surf these extranets. They call their new product Internet Explorer/ Extranet Explorer (IE/EE) and set up a Web site with the URL www.ieee.com to distribute the browser.

Everyone thinks this new Web site belongs to the standards body IEEE. Microsoft, through a chain of carefully planned, ruthless events, takes over the power of the IEEE and assumes control of the world by making each and every Microsoft product a standard. Oooh, scary!

Jim Mullen
Lancaster, Pa.

Teletoons


·Suspicions Confirmed·
# 25
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Phil Frank

Phil Frank and Joe Troise **baba@sfgate.com**

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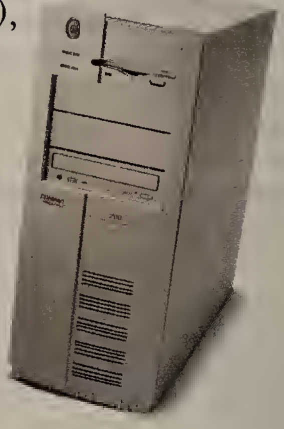

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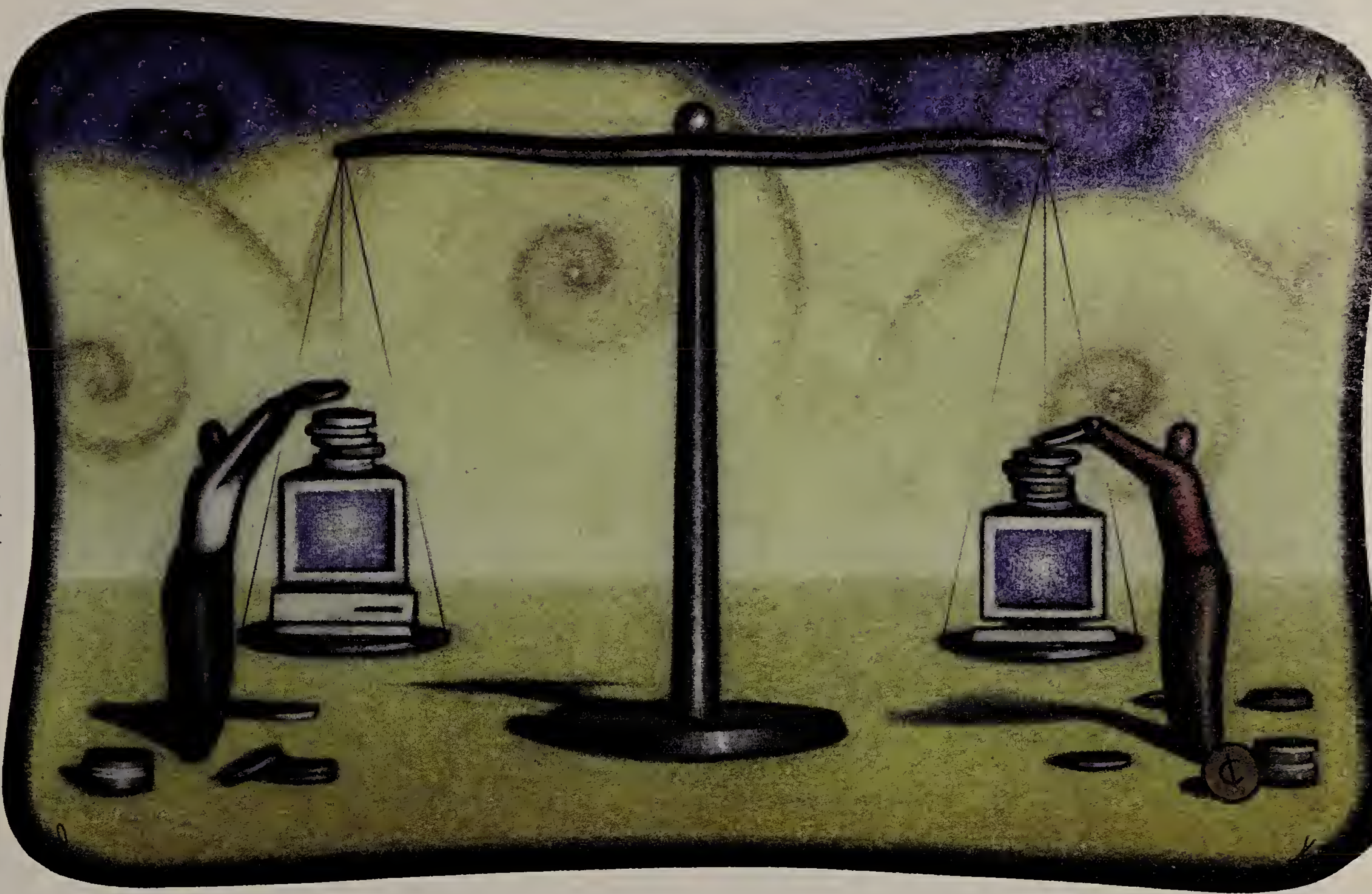
DIGGING FOR TRUTH IN NC COST ESTIMATES

Feature

Continued from page 1


TROY THOMAS

Nobody, for example, has yet delved into questions addressing factors such as the productivity benefits to be achieved with one device vs. another, or the integration and migration costs that are associated with NCs. Assumptions are rampant, simply because there is no NC knowledge base to work from; instead, analysts extrapolate from user experiences with X terminals or diskless workstations.

Analysts freely admit this is not an exact science.

"We're not fussy about what the exact numbers are," says Bill Kirwin, vice president and research director at Gartner Group, Inc. in Stamford, Conn. "People report anywhere from half to three times what we estimate — it's more important for our numbers to be in the ballpark."

This is not to say that NCs flat-out won't save you money. They might. On the other hand, they may only transfer administrative costs to a different place, such as from the client to the server. The point is, you can't take analyst estimates at face value. You've got to look behind the numbers, understand how they were arrived at and think about what they don't tell you.

"Each analyst's studies reflect different types of user bases, as well as different choices of what costs to include and exclude," says Greg Blatnik, vice president at Zona Research, Inc. in Redwood City, Calif. Zona, for example, focused on workgroups of about 15 users and a single server. Gartner, on the other hand, looked more at large companies with revenues of $1 billion or more.

"These sorts of studies definitely don't present the entire picture," Blatnik says. "They usually don't take into account factors such as productivity or new application deployment costs." Additionally, he notes, there's a wide variation in costs for the same thing, such as the salary for systems administrators — they simply cost more in most large metropolitan areas.

Proper use of these studies also requires that you understand what you sacrifice by replacing PCs with NCs. If you were Federal Express Corp., would you replace your trucks and planes with bicycles because the latter cost less to buy and maintain? Probably not, except in some very specific locations.

> *"The NC folks would like to have you believe support costs of existing PCs is the only thing that matters," NCRI's Hutchinson argues.*

What's an NC?

We're using the term "network computer" to refer to any of three types of machines:

- Client-oriented NC. This is typically a diskless device running a thin-client operating system. Code such as Java modules executes locally but resides on the server, so server connectivity is essential. Some types may not inherently support Windows applications, so you may also need a server-based emulator such as NTrigue, from Insignia Solutions, Inc. Examples: Sun Microsystems, Inc. JavaStation; Wyse Technology, Inc. Winterm 4000; and NC standards from IBM, Netscape Communications Corp., Oracle Corp. and Sun.
- Server-oriented network computer. This is basically a diskless smart terminal with the application executing on a server. Example: Citrix Systems, Inc. WinFrame used with Wyse terminals.
- NetPC. Windows-based diskless or disked PC that has no data stored locally; its "identity," meaning user profile and configurations, is server based. Example: Microsoft Corp.-Intel Corp. NetPC specifications.

The standard against which NCs are compared and contrasted in most analyst studies is a PC running Windows 3.X or Windows 95, attached to a LAN for file and print services, with typical quality of management. "Typical," it seems, translates to anywhere from average to poor; few corporate desktops are being managed anywhere near as well as they could be.

Crunching the numbers

Probably the most quoted TCO figures come from Gartner, which has annualized its numbers. Gartner's assumptions include a three-year cost cycle for hardware and software purchases, and the company has averaged out costs that spike in the first or final years, such as installing and configuring new applications (see Figure 1, page 44).

According to Gartner's figures, Sun JavaStations, along with similar offerings on the way from other vendors, are likely to be the most cost-effective of the NC choices, saving companies as much as 40% in purchase and support costs as compared to desktop PCs. That might be more than you'll save by simply managing

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There's more network computer (NC)-related info on Network World Fusion.

- **An NC overview from Oracle subsidiary Network Computer, Inc. (Check out the FAQ.)**
- **A JavaStation overview from Sun Microsystems.**
- **The skinny on Citrix's WinFrame Windows server.**
- **An analysis of Oracle's Network Computing Architecture from Gartner Group.**
- **Gartner's take on Larry Ellison's NC vision.**
- **A Yankee Group study examining corporate PC use, intranet adoption and NC plans.**

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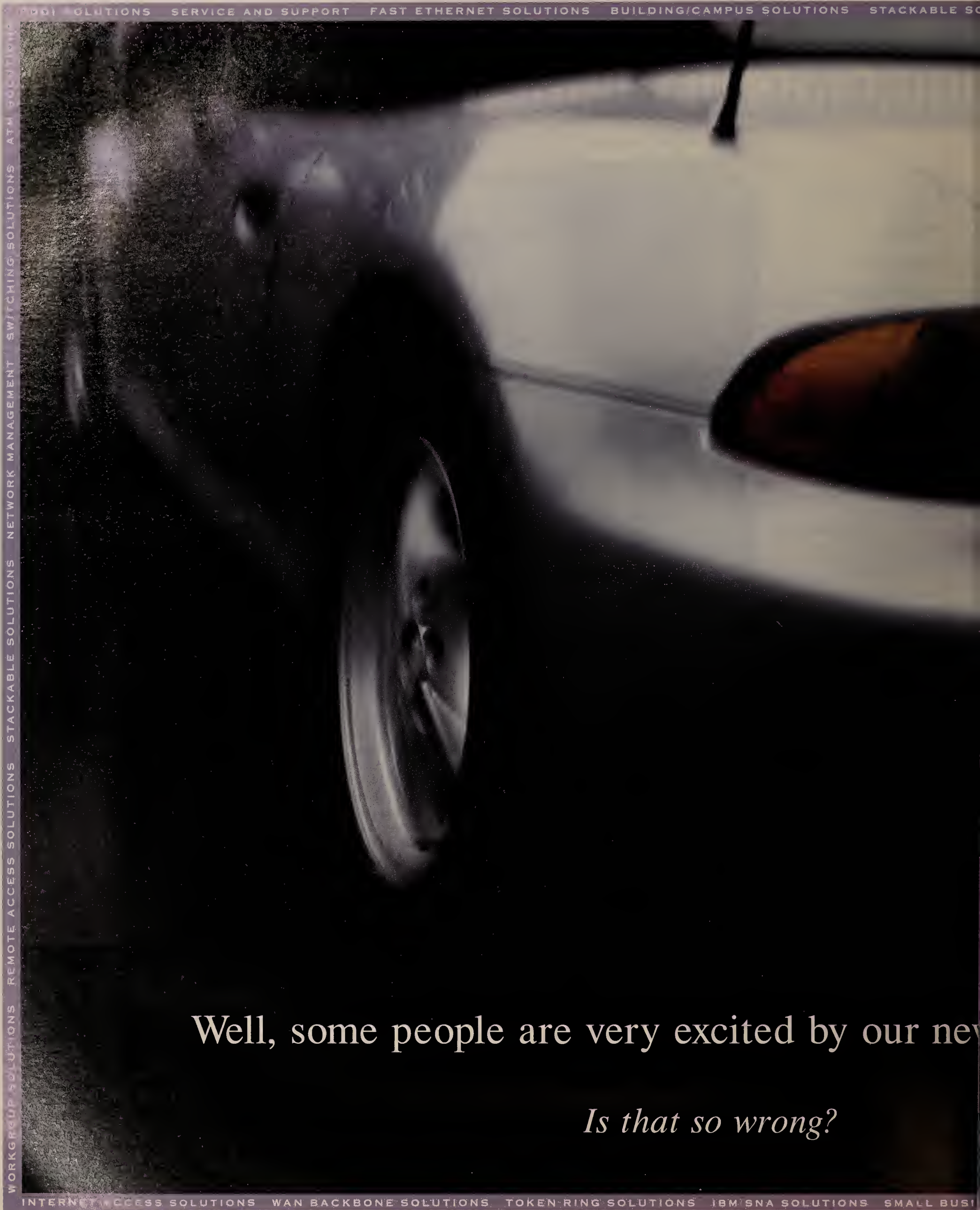
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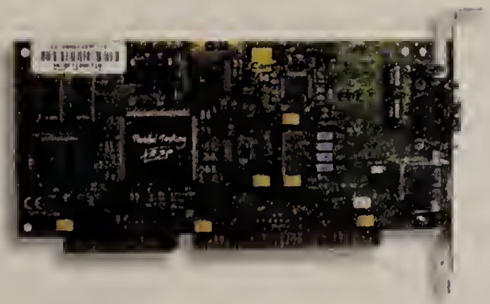

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NETWORKS THAT GO THE DISTANCE

your PCs better, but the numbers don't take into account the cost of migrating to NCs in the first place.

Putting several of the leading market research firms head-to-head in what is admittedly not an apples-to-apples comparison, due to the varying methods research firms use to reach their conclusions, it appears annual TCO savings of $2,000 to $3,000 for each user station, or 30% to 45%, wouldn't be surprising.

Indeed, judging by analyst projections (see Figure 2, page 45) any NC strategy should offer savings of 20% to 30%, with the Java-class solution doing best. But so can implementing "best practices" with existing systems, according to Gartner.

"We believe you can get a 25% to 30% cost reduction by simply managing your current PC environment better," Gartner's Kirwin says. Better management includes providing adequate technical support resources; applying state-of-the-art systems management, including remote diagnostics and control; doing electronic software distribution; and imposing greater levels of standardization.

"We're not fussy about what the exact numbers are," Gartner's Kirwin says. "People report anywhere from half to three times what we estimate — it's more important for our numbers to be in the ballpark."

With NCs, standardization is pretty much enforced, Kirwin says, because you have a standard client configuration, built-in system management technology and centralized management. "Network computers are the embodiment of best practices," he says.

Best practices can include simpler things, as Ryder System, Inc. has shown. Wilbert Williams, group project manager for Ryder, based in Miami, says his company has centralized the ordering of PCs and reduced the number of vendors and configurations it deals with. "Up-front capital costs of PC hardware and software have been cut by at least 20%," Williams says.

Further, he anticipates reductions in support costs because "with this smaller number of system types, we can now test 100% of our applications on each PC configuration before shipping them to the field." Equally important, the value of the PC systems to the user and user satisfaction have both gone up because the company can ship bug-free applications sooner.

At present, about 6,000 Ryder PCs are involved; Williams anticipates 10,000 to 15,000 PCs will ultimately be deployed under these cost-saving measures. So it's clear that NCs have serious competition in the dollar-savings arena.

And, referring again to Figure 2, you'll also note the sheer range of numbers given by some analysts. Depending on your particular situation, there could be cases where it actually costs more to have and hold an NC than it would a PC.

WINDOWS 95 SUPPORT COST ESTIMATES

Figures reflect the cost per user per year. Hourly rates vary based on category.

Category	Hours	Cost
Operations	130	$4,350
Tech support	approx. 36	$1,700
Administration	32	$1,500
Network support	10	$638
Peer support	10	$600

SOURCE: Gartner Group, Stamford, Conn.

No wonder there's a lot of cynicism out there regarding these cost-of-ownership studies.

"Most of the comparisons are made on the basis of clearly insufficient information and insufficiently precise assumptions, or they are applicable to a range of buyers and apps, but not the whole market," says Thomas Nolle, president of CIMI Corp., a Voorhees, N.J.-based consultancy.

Among Nolle's questions are whether licenses for Java-based code will cost less than existing software and how existing applications might perform on diskless machines. "What will Microsoft Office do when the code says, 'Write current keyboard buffer to disk,' but your system doesn't have a disk?"

Putting several of the leading market research firms head-to-head...it appears annual TCO savings [with NCs] of $2,000 to $3,000 for each user station, or 30% to 45%, wouldn't be surprising.

Art Hutchinson, senior consultant at Boston-based Northeast Consulting Resources, Inc. (NCRI), agrees it's too early to accurately assess NC ownership costs. "Nobody really knows yet — there isn't enough data or experience," he says. "The products are just emerging, and a lot of the costs — such as support or management — may be hard to identify early in the game."

Research firms admit, and even caution, that there is potential for variation between the numbers that they present and what your experience might be.

Bob Tasker, senior vice president of computing research at The Yankee Group, sees his firm's figure as a "two sigma number," meaning "66% of the people impacted will be within plus or minus $500 of it, and 95% within $750.

He also cautions that the TCO figures d not include the cost of migrating applications to the new environment.

The wide range in International Dat Corp.'s (IDC) numbers reflect the variety of sites in its survey, according to ID analyst Chris Christianson.

In Figure 2, those spending $4,00 annually per use represent larg centralized site running production environments those shelling ou $12,000 per yea per user are "larg distributed environments with hundreds of remot locations and wit business processin workloads," Christianson says. IDC surveyed several hundre PC and terminal-oriented shops, he say with the NC data extrapolated from diskless PC user information.

Rather than replacing PCs, as a rul Christianson sees NCs going to new tur especially in terminal-based environment In that scenario, NCs are likely to cos more — 25% per year for each user ove five years — but they will bring improve functionality.

Making the choice

So how do you decide whether NC make sense in your situation?

Assume for a moment that a given N can do the tasks currentl being handled by PCs, an that there will be cos reductions as claimed You've still got to get fro here to there, meanin migrating applications buying new equipment an staging everything over.

To determine whethe it's worthwhile, Kirwin say you've got to compar your estimated migratio costs to the anticipated savings over time. For example, if it will cost $5,000 pe system to migrate and yo only expect $1,500 per system per year in reductions it's a raw deal. "If you can't recover you migration costs within two years, skip it, he says.

Theo Forbath, a consultant at NCRI, say you should pick your spots for NCs. "If yo live in a world where dumb terminals pla a vital role, you will do well with an NC, he says.

Similarly, according to Forbath, for supporting workers, such as receptionists, support people or administrators, who rely o a relatively fixed desktop, companies ma see lower TCO with NCs. On the othe hand, "a lot of folks will still need noteboo computers, which can't currently b replaced by NCs."

FIGURE 1: PC VS. NC — A COST OF OWNERSHIP COMPARISON

All costs are per user per year.

	Capital	Tech /Support	Admin.	User	Total
Win95 desktop PC (hardware and software)	$2,532	$1,704	$1,497	$4,052	$9,784
Network computer w/Java	$1,670	$1,481	$669	$2,192	$6,010
Network computer w/server	$1,896	$1,497	$771	$2,611	$6,775
NetPC	$2,396	$1,536	$828	$2,507	$7,267

Definitions:

Capital: Hardware and software

Administration: Nontechnical support, including administrative, nontechnical direct and indirect management costs, such as:
- Asset management, including inventory/ lifecycle database
- Procurement cycle (purchasing)
- Development of policies and procedures
- Enforcement of policies and procedures
- Legal review
- Security administration
- Formal audit
- Informal audit
- Client purchasing cycle
- Administrative costs of installation (i.e., paperwork and scheduling)

Technical support: Nonadministrative support services provided by professional support staff – usually IS and outsourced vendors. Includes:
- Tier 1, 2, 3 support services (help desk and higher level professionals)
- Training
- Documentation
- User support mechanisms such as newsletters and user groups
- New product review
- Product rollout and migration
- Network administration
- Capacity planning
- Adds, moves, changes and upgrades
- Server purchase and upgrade
- NOS administration

User: The responsibilities end users have in maintaining their systems.
- Learning how to use the system
- Peer support (helping other users)
- Personal use of corporate technology
- Application development
- Local data management such as creating directories, hard-disk backup and finding files

Typically not included in total cost of ownership calculations:
- Server costs
- Value to user (productivity lost during upgrades, unscheduled server and client downtime, etc.)

SOURCE: GARTNER GROUP, STAMFORD, CONN.

You've also got to consider whether TCO estimates measure enough of the problem to be a useful guideline.

"The NC folks would like to have you believe support costs of existing PCs are the only thing that matters," NCRI's Hutchinson says. "I haven't seen discussions with clearheaded assessment of the 'benefit of ownership' for each approach, such as worker empowerment and work teams, and whether employees are still able to be as productive, mobile, flexible and creative for the business." If the value of the employee goes down because, say, that person can't plug in while on the road, he says any savings may be negated.

FIGURE 2: TOTAL COST OF OWNERSHIP RESEARCH — READER BEWARE

TCO per user per year	Gartner Group	The Yankee Group	International Data Corp.
Wintel PC with average management capabilities	$9,784	$4,500 - $7,500	$4,000 - $12,000
Network PCs	$6,000 - $7,267	$2,000 - $4,000	$2,535 (Text-only terminal) $5,713 (IBM network PC)
Projected cost avoidance with NC:	$3,000	$3,000	Approx. 45% less than PCs

Three leading market research firms addressed the network computer (NC) cost of ownership question and reported fairly dramatic differences in total cost of ownership for PCs and NCs. But, in at least two cases, the firms reported similar results in terms of what NCs might save.

Comparing the results in this fashion points to the myriad variables that can be thrown into the equation. For example, IDC and Yankee numbers for PC cost of ownership account for clients only; they do not include LAN and server hardware, software and administration costs. IDC numbers also reflect studies against a range of workloads and configurations, so IDC warns the data is not universally applicable. As such, a direct comparison of IDC's cost avoidance figure with the Yankee and Gartner numbers is not meaningful.

It's clear that numbers from any such research group should be taken with a large grain of salt. They are intended to reflect generalities only, not actual costs that you can expect will map to your situation.

"What we tell our clients is that this is a real horse race," Gartner's Kirwin says. He recommends a three-step course of action. First, clean up your existing PC installed base, implementing best practices. Second, look to places such as branch offices that can benefit from server-based offerings that deliver Windows-based applications, such as Citrix's Winframe.

And third, target specific-function NCs, such as JavaStations, for highly structured environments. "There's a place for all these technologies, and none will be a clean sweep of the market," he says.

CIMI's Nolle remains cynical. "A network computer will never be a substitute for a desktop system for any user with a significant degree of computer literacy. The storage and flexibility limits of NCs mean that knowledgeable users will always be dissatisfied with performance."

> *"A network computer will never be a substitute for a desktop system for any user with a significant degree of computer literacy," CIMI's Nolle says.*

What about NCs as a terminal replacement? "Network computers will not be a substitute for 'dumb terminals' in any applications where the connection would have to be rearchitected, or where there is no economic benefit to doing the conversion," Nolle says.

There will, he believes, be some cases where NCs will replace 'dumb display functions' during the next five to 10 years. "But the network computer will not displace desktop computing significantly."

Instead, sensible planners will consider the various flavors of NCs where they have to deploy new hardware or replace old hardware anyway. Meanwhile, be on the lookout for ways to manage those existing networked desktop PCs more efficiently.

Dern is an independent author, speaker and consultant focusing on Internet/intranet benefits, strategies and concerns for businesses and end users. He can be reached at ddern@world.std.com.

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NetworkWorld PC WORLD

SERVER TEST SERIES

Simmering servers, large and small

By Bill Rinko-Gay

When we asked server vendors for their best enterprise server costing less than $30,000, we didn't realize what a difficult request it would be to fulfill. Hewlett-Packard Co. and SAG Electronics were the only vendors that took up our challenge.

HP's NetServer LX Pro is a full-fledged enterprise server with all the engineering and support you expect from HP. To achieve a low price point, HP sent us a machine configured with 166-MHz Pentium Pro processors and only 4M bytes of RAM on the RAID controller.

By contrast, SAG's STF Quad RAID 5 is a collection of parts assembled from OEMs at a low price. This gave it an edge in a pure price/performance competition, but showed a flaw when we had problems with the Adaptec, Inc. four-port network adapter the vendor originally sent us.

We liked the NetServer better, even though it is more expensive and slower. An enterprise server still needs to be remotely managed, and you don't want to be the company that helps your server vendor work out its bugs. Still, more price-sensitive organizations willing to put up with a little hassle to save money will like a hot performer such as the STF Quad RAID 5.

Meanwhile, following up on last month's look at four workgroup servers priced under $6,000, we tried out Dell Computer Corp.'s PowerEdge 2100. In a different class from the two enterprise servers, the PowerEdge 2100 showed good performance, a reasonable feature set and a low price.

Download complete server test results and more details about our test methodology. Enter the number to the right in the DocFinder box on the home page.

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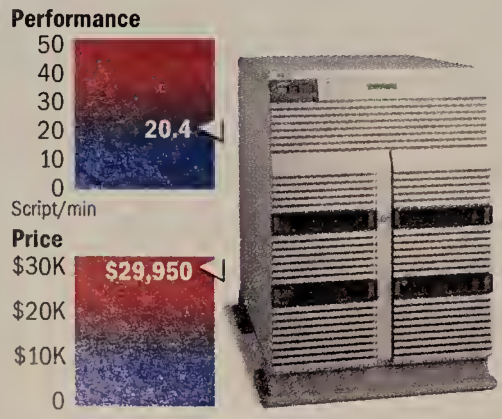
NetServer LX Pro

Vendor: Hewlett-Packard Co.

Contact: (800) 752-0900
hpcc997.external.hp.com:80/netserver/products/lx_main.html



With a $29,950 sticker price, the HP NetServer LX Pro 6/166 SMP just sneaked under the $30,000 price limit used in this round of enterprise server testing. It proved to be a solid product for the money.

The four 166-MHz Pentium Pro CPUs in the LX Pro 6/166 SMP offer less processing power than the 200-MHz Pentium Pros in the HP NetServer LX Pro 6/200 SMP we tested last November (*NW*, Nov. 25, 1996, page 45), but the rest of the LX Pro 6/166 SMP is the same or better.

This model provides a good overall balance among price, features and performance in an enterprise server. As a file server, the LX Pro 6/166 SMP was nearly as fast as the 200-MHz STF Quad RAID 5 from SAG and only 20% slower in Windows NT database server testing. This performance is in addition to excellent redundancy features and solid HP engineering.

The chassis can hold 12 hot-pluggable drives, four standard drives and two diskette drives. Open the two lockable doors covering the drive bays and you see what appears to be two computers — almost as if HP decided to create the LX Pro by merging two LH Pros into a single cabinet. Both the doors and the hot-pluggable bays inside can be locked to provide double security.

Removing the top by loosening up some thumb screws reveals a horizontally mounted system board, two PCI slots and four EISA slots. The processor and memory cards are covered by a separate panel that can be removed with a Torx screwdriver. To gain access to the drive bays' backplanes, you simply lift off the two side panels. Service is made easy by the complete and clear configuration labels under the cover, some with troubleshooting tips.

The system has three redundant 410-watt hot-pluggable power supplies. It also provides Automatic Server Restart to handle an unattended shutdown.

HP offers an optional Remote Assist card, which enables you to remotely manage the server when it does not respond to the network.

In keeping with its hallmark trait, HP provides excellent service and support. A bootable CD-ROM contains NetServer Navigator to help you configure the machine for your operating system, although HP doesn't provide the operating system or an installation program. Navigator also provides hardware configuration utilities as well as NetServer Assistant, an HP product that can be used to manage your NetServer via the version of HP OpenView supplied with the server or any SNMP-compatible management program. Diagnostic Assistant, a program to help you find the causes of problems you may encounter, is also included.

Written documentation is sparse but is more than adequate to get you up and running. With the utilities and documentation on the bootable CD, the LX Pro is straightforward to administer.

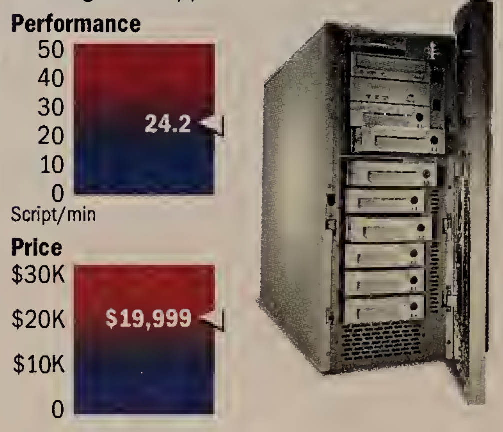
Hewlett-Packard Co. **NetServer LX Pro**

OVERALL SCORE	7.5
Performance **(30%)**	7
Features and flexibility **(30%)**	8
Management apps/features **(20%)**	8
Serviceability **(20%)**	7

STF Quad RAID 5

Vendor: SAG Electronics

Contact: (800) 989-3475
www.sagelec.com/products.html



If you're willing to put up with the time it takes to work with SAG Electronics to get things properly configured, then the company's STF Quad RAID 5 is worth a look. The server comes configured with several high-performance options and a valuable 12G-byte DAT drive for $19,999.

The unit turned in good overall performance. While it only squeaked past the HP NetServer LX Pro 6/166 SMP in our file server test, it was 23% faster in Windows NT database testing and 19% faster in Lotus Notes testing.

However, be aware that SAG currently doesn't ship a multiprocessor version of Novell, Inc.'s NetWare, although the firm says it will fully support NetWare 4.11 for anyone who wants to run it on this server. Our performance scores were generated under Windows NT 4.0, which came with the server.

Also, consider the cost of having to

resolve possible configuration problems in a unit that has been shipping for only a month. For instance, the server showed up in our lab with an Adaptec four-port Ethernet adapter. However, we had to return the adapter because it wouldn't work with the server's American Megatrend, Inc. (AMI) motherboard on large networks. SAG found out about the problem only when we reported it and is currently working with Adaptec and AMI on a fix.

The four single-port Adaptec Ethernet cards installed as a replacement worked fine, but they took up all the available PCI slots. This meant that SAG had to replace the PCI-based SCSI board it installed in the original server to control a CD-ROM and DAT drive with a slower ISA-based SCSI controller.

The chassis is a large tower with reasonable room for hard-drive expansion and plenty of cooling. It's easy to get inside with a screwdriver. The hot-swappable drive carriers that SAG included are behind a locked door and individually locked in place for additional security.

SAG Electronics **STF Quad RAID 5**

OVERALL SCORE	7
Performance **(30%)**	8
Features and flexibility **(30%)**	6
Management apps/features **(20%)**	7
Serviceability **(20%)**	7

The two processor cards were easy to access, but the memory card seemed to be bolted in place. However, the dual in-line memory modules can be removed easily from the memory card while it is in place. Internal cable routing is a bit of a problem, as the power, SCSI and LED wires tend to obstruct the card area.

As for management, the MegaRAID adapter won't support SNMP until the second quarter. You can control the rest of the server using Intel's LANDesk, which SAG provides as an option. You can also use the optional card that comes with LANDesk Pro to dial in to the server when it does not respond over the network.

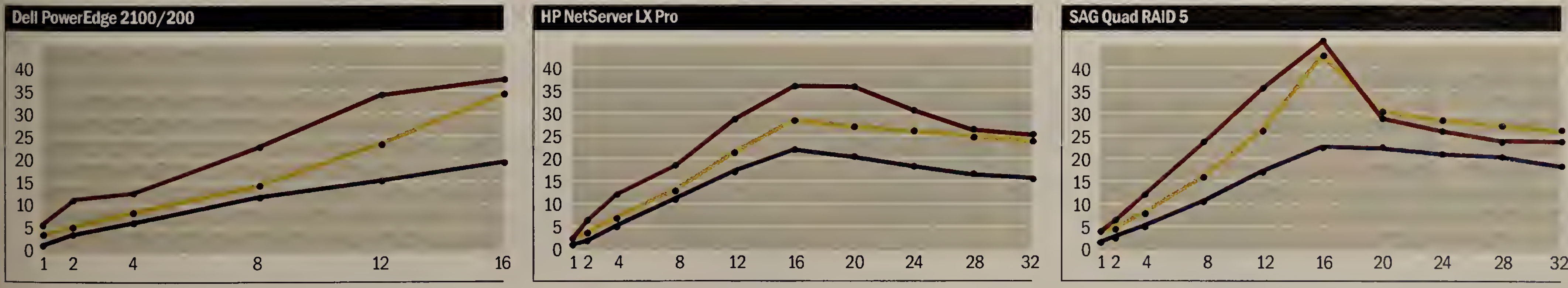
The STF Quad RAID 5 doesn't come with any documentation from SAG. Instead, you get documentation from each of the OEM vendors, but that's more than sufficient to administer the server.

SERVERS: THE INSIDE STORY

	Hewlett-Packard Co. ENTERPRISE		**SAG Electronics** ENTERPRISE		**Dell Computer Corp.** WORKGROUP	
Model	HP NetServer LX Pro 6/166 SMP		STF Quad RAID 5		Dell PowerEdge 2100/200	
Processor	4 166-MHz Pentium Pros with 512K-byte Level 2 cache		4 200-MHz Pentium Pros with 512K-byte Level 2 cache		200-MHz Pentium Pro with 256K-byte Level 2 cache	
Max. processors	4 200-MHz Pentium Pros with 512K-byte Level 2 cache		4 200-MHz Pentium Pros with 512K-byte Level 2 cache		200-MHz Pentium Pro with 256K-byte Level 2 cache	
Memory	**As tested**	**Maximum**	**As tested**	**Maximum**	**As tested**	**Maximum**
	256K bytes	2G bytes	256K bytes	1G byte	64M bytes	256M bytes
Slots	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**
EISA	4	4	5	2	3	3
ISA	0	0	0	0	0	0
Shared	0	0	1	0	0	0
PCI	6	1	3	0	3	2
Processor	2	0	2	0	0	0
Bays	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**
Internal	0	0	0	0	3	0
External	6	4	5	2	3	1
Hot-plug	12	4	6	3	0	0
Storage						
Adapter	HP NetRaid		AMI MegaRAID with 32M-byte cache		Integrated Adaptec AIC-7880P	
Bus	Ultra-Wide SCSI-2		Ultra-Wide SCSI		Ultra-Wide SCSI	
Capacity	17.2G bytes		12.9G bytes		6.3G bytes	
Model	HP (Seagate ST32550WC)		Seagate ST34501W		Seagate Barracuda ST-32550W	
Maximum drive capacity	**Internal**	**External**	**Internal**	**External**	**Internal**	**External**
	124G bytes	1T byte	81G bytes	1T byte	27G bytes	54G bytes
CD-ROM	Toshiba XM5401-TA 4x SCSI		Plextor PX-12CS 12x SCSI		NEC CDR-1410A 8x SCSI	
Network adapter	4 HP 10/100TX PCI LAN adapters		4 Adaptec ANA-6911/TX		Intel EtherExpress Pro 10/100 Ethernet	
Fault-tolerance features	ECC, optional RAID 5, Automatic Server Restart, hot-swappable drives		ECC RAM, RAID 5, redundant 600-watt power supplies, optional redundant RAID 5 controllers		ECC memory, remote reset, optional out-of-band reset (later this year)	
Security features	BIOS passwords, keyboard lock, power switch lock, EISA configuration protection, port disable, floppy disable, cord lock connection		BIOS password, front-panel door lock, each drive can be physically locked separately		BIOS password, keyboard lock, floppy boot disable	
Bundled software	HP NetServer Navigator includes Configuration Advisor, Configuration Assistant and Diagnostic Assistant, HP OpenView for Windows		DMI-compliant Server Management Package, optional recognition for remote dialing		Internet bundle	
Miscellaneous	Toll-free support during standard business hours, 3-year next-business-day on-site service, optional 4-hour response, optional 7x24 support		Toll-free support, 60 hours a week, 3-year warranty on system, 5-year warranty on drives, memory and CPUs, optional extensions, RAID 5 controller can add a drive without a system shutdown, 24G-byte Sony SDT-9000 DAT drive included		3-year warranty, 1-year next-business-day on-site service, additional years optional, Direct Line option, Dell Software Support option, installation service option, custom download option for server available	

PERFORMANCE SUMMARY

We measure performance from the client's point of view and report the time it takes to complete typical tasks. Our performance summary graphs show the results of each test in scripts per minute with numbers of clients ranging from one to 16. Because the tests run faster than a real client could perform the operations, each of our test clients stresses the servers as much as several real users would.



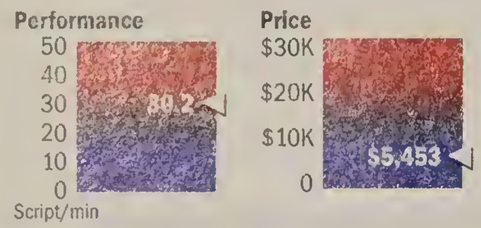
FILE SERVER Our file server tests run scripts on ascending numbers of clients for four applications: Microsoft's Word and Excel for Windows, Lotus' 1-2-3 for Windows and Corel's WordPerfect for Windows. The scripts perform file access operations, such as opening, importing and saving files.

DATABASE Our client/server database test uses Microsoft Access on the front end and Oracle Server 7.3 on the back end. We perform various read and write operations on a three-table payroll management application.

WEB SERVER Our Web server test uses Netscape Enterprise Server 2.0 under Windows NT, and Novell Web Server 2.51 under NetWare. We view pages containing text and graphics, and use Open Text's Livelink Search 7.0 to search a 1G-byte document database.

PowerEdge 2100/200

Vendor: Dell Computer Corp. **Contact:** (800) 388-8542
www.dell.com/products/powredge/pe2100



Boasting a 200-MHz Pentium Pro processor with 256K-byte Level 2 cache, three Seagate Technology, Inc. Barracuda hard drives, an integrated Adaptec Ultra-Wide SCSI controller and an Intel Corp. EtherExpress Pro adapter, Dell's PowerEdge 2100 made quick work of our workgroup server performance tests at a surprisingly low price point of $5,453. In fact, its only disappointing performance was its function as an NT Web server.

Dell Computer Corp. **PowerEdge 2100/200**	
OVERALL SCORE	**7.2**
Performance **(40%)**	7
Features and flexibility **(40%)**	7
Management apps/features **(10%)**	8
Serviceability **(10%)**	8

The PowerEdge 2100 comes in a minitower configuration with integrated SCSI and video adapters. It has three EISA and three PCI slots, all empty except the PCI slot that holds the Intel network interface card. The interior has a design free of cable clutter, which makes the parts easy to access.

The three internal drive bays can be either half or full height and are mounted in a removable bracket, although you have to remove the front bezel to get at it. Otherwise, it's a handy design for drive maintenance. Internal storage expandability is limited.

On the software side, Dell provides Intel's LANDesk Server Version 2.5, which monitors the server's status over the network, as well as a set of drivers and an EISA configuration utility. In the near future, Dell will provide an adapter card, which will let you dial in and diagnose or reboot your server even when it can't reach the network. There's also an optional Internet bundle and custom downloads available, both of which can be preinstalled. ■

New test debuts

In last month's review of workgroup servers, we introduced PC WorldBench for Servers 2.0, which includes a Web server test and upgraded software for the Notes, Oracle and file server tests. This month, we're showcasing a new test methodology for the first enterprise servers to be measured under Version 2.0.

The test works like this: We run our regular benchmarks on 1, 2, 4, 8, 12 and 16 clients and plot the results. We then add clients running an intensive I/O load program in increments of four while running PC WorldBench for Servers 2.0 on the original clients until we reach 32 clients.

By using a background load instead of additional WorldBench clients, we can stress powerful enterprise servers with only 32 nodes while still measuring their effectiveness at running actual applications.

Note that our scorecard weighting for enterprise servers differs from our weighting of workgroup servers to emphasize the manageability and serviceability qualities that are more important for large organizations.

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Briefs

■ **Hewlett-Packard Co.** *says users can now sign up for any HP training course with more than two dozen authorized resellers participating in HP's* **Education Reseller Program.**

Under the program, HP gives its top 150 **authorized resellers** *the ability to sell seats for courses at any of the company's 25 training centers. Participants can also resell HP dedicated or on-site training courses, or arrange for large-group training at a non-HP site.*

HP: (800) 472-5277.

■ **The Inter/Intranet Application Development Conference and Exposition** *(www.spgnet.com/CONF/default.htm) will be held on* **March 26-28** *in New York.*

Senior application developers and IS managers can tap into the world of electronic commerce applications and discover how to use intranets for internal development. There will be sessions on Java, building transactional systems, application integration, distributed object strategies and tools, and software quality and testing. The complete conference costs $795.

Software Productivity Group: (508) 652-1202.

■ **TCS Management Group, Inc.,** *a call center software and consulting firm, will kick off its second annual* **Call Center Showcase Tour** *next month.*

During the tour's four-month run, 30 first-class call centers — including the ones used by The Chase Manhattan Corp., Lucent Technologies, Inc., Hewlett-Packard Co., Time Warner, Inc. and Westin Hotels & Resorts — will be among those opening their doors to visitors for a day. In the morning, visitors to each site will attend a workshop on call center management and staffing strategies, or on advanced workforce management issues. The afternoon will be open for a full tour.

As part of the $95 advance fee, you get PC-based software for calculating your call center resources.

TCS: (615) 221-6910.

Get project success by letting individuals pull together

Fostering teamwork and collaboration can keep high-tech projects on track.

By Hubbert Smith

Hop onto Network World Fusion for more about fostering teamwork and collaboration. Enter the number to the right in the DocFinder box on the home page for links to:

FIND IT ON FUSION 0825

- **An MIT Sloan School of Management Center for Organizational Learning case study about how teams and collaboration helped speed the development of a new car. The study focuses more on the human aspects of management and teamwork than on car design and manufacturing technology.**
- **A few tips for improving cross-functional collaboration from a newsletter published by the University of Utah Hospitals & Clinics Management's human resources group.**
- **A model developed by the Organization Effectiveness Group, a consulting firm in La Jolla, Calif., which shows how to create teams that will make decisions based on informed cooperation.**

www.nwfusion.com

When the thrill of being picked to head up the most strategic project of the year wears off, you suddenly realize the real challenge: rallying your team around project goals.

Your team will have its fair share of free-spirited and independent minds. These people are technically smug, completely hardened to all known management tactics, and they don't even report to you. But, boy, are they good.

Before you grab for that stress-relieving squeeze toy, consider establishing an atmosphere where team members are given enough latitude to solve problems using their individual skills but collaborate when necessary.

Your first step is to clearly define and communicate project goals. As you do this, make sure to spell out what problems need to be solved before jumping ahead to lay out solutions.

Next, you need to state the project scope, schedule, resources and how the work will be measured. While some things should be left in the hands of the team, these issues are not among them. Certainly, get team input, but you will make the final call.

Communicate project goals as if you were painting a picture in the minds of your team. Go to extraordinary lengths to overcommunicate the goals in group meetings and then to each team member individually. Explain to each participant their unique role in bringing concept to reality. As early project deliverables start to roll in, compare them with the goals to make sure everyone is looking at the same project picture.

Pick up the decision pace

Once goals are clear, divvy up the work. Get team input on how to disassemble the project into small parts and assign an owner to each one. If it is a client/server application development project, give ownership for creation of various software modules to different people.

Give final decision-making authority to the owner of each part, with two qualifiers: All decisions must support project goals; and owners of two parts that will ultimately be joined must agree with each other's decisions. (You will act as a tiebreaker when disputes arise.) Be sure to create a record of all critical decisions.

This approach may seem to grant more worker autonomy, rather than require more collaboration. But it speeds the pace of decision making and avoids a lot of unnecessary confrontation. If two people are working on a problem, and it's clear which one has the final decision, the conversation takes on a pleasant tone of "I hope you'll take my suggestion," rather than provoking an argument. The result is people will openly listen to each other rather than mentally construct a defense for why they took a particular course of action.

When the project requires modules or systems to interface, there must be coordination. Giving ownership of modules to specific people avoids unnecessary confrontation, but allows negotiation to occur when modules need to be linked.

Totally avoiding confrontation in these situations can be a problem, because programmers often stay away from situations in which they might be proven wrong. Therefore, it's your job to identify decision deadlocks brought on when module owners are at odds. You then have to broker a decision and keep a record of it.

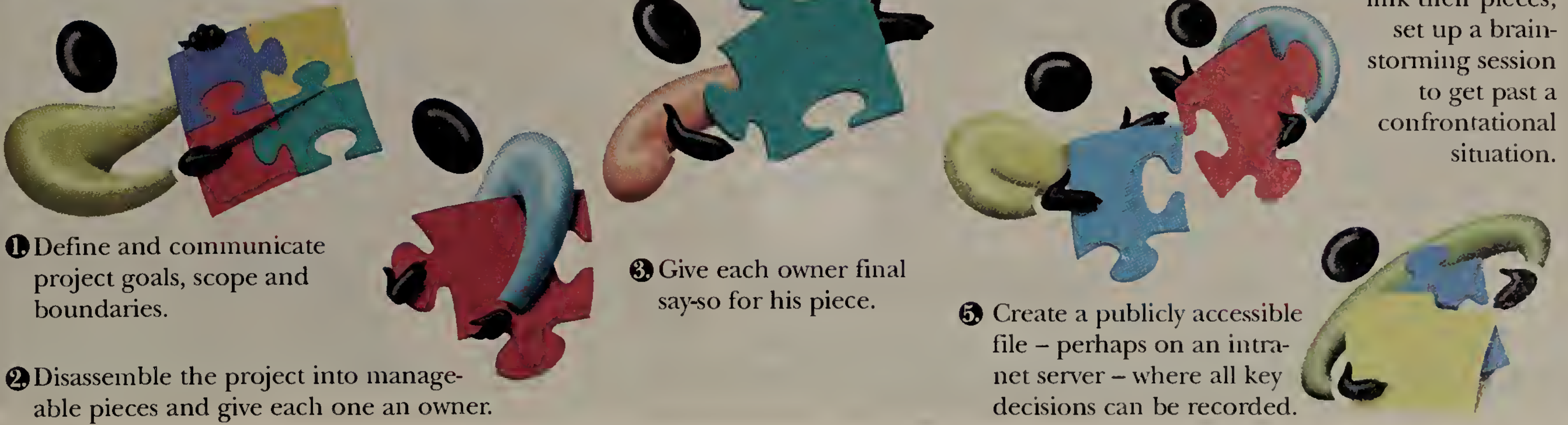
The remedy is to have a team brainstorming meeting where key sticking points are defined and everyone is free to suggest solutions that preserve as much of the completed work as possible. In such an environment, participants will focus on solving the problem rather than defending their positions.

The agenda for this brainstorming session should include time for problem definition, idea generation, clarification and reaching consensus. Once a decision is made, record it in a place everyone can access, such as on an intranet server. If you don't, detractors will revisit issues repeatedly, hoping to implement their solutions.

Taking these steps can get your project off to a good start and put your independent-minded team players on a collision course with something they may have been trying to avoid — collaboration.

Smith is a project manager at a large computer company. He can be reached at hubbert@geocities.com.

FIVE STEPS TO IMPROVED PROJECT COLLABORATION



❶ Define and communicate project goals, scope and boundaries.

❷ Disassemble the project into manageable pieces and give each one an owner.

❸ Give each owner final say-so for his piece.

❹ When owners are deadlocked over how to link their pieces, set up a brainstorming session to get past a confrontational situation.

❺ Create a publicly accessible file – perhaps on an intranet server – where all key decisions can be recorded.

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Master's degree in Computer Science or Computer Engineering. 2 years of related experience in HP UNIX and SYBASE servers design, tuning, including UNIX scheduler (MAESTRO). Yearly Salary: $50,000. Send resme to Lina Leckey or Karen Kosowan (Human Resources Manager) of McKesson Corporation, 1220 Seniac Drive, Carrllton, TX 75006. AD paid by and Equal Opportunity Employer.

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MANAGER OF INFORMATION & LEARNING TECHNOLOGIES

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The successful candidate will be familiar with technologies needed in an acedemic environment, such as networking, digital transmission of information, computer-based presentation and training, learning models using technology, multimedia and hypermedia applications, computer supported collaborative learning, external simulations, and computer based tools.

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Qualified applicats should submit a letter of application, resume and the names, addresses and telephone numbers of three referenced to: Ms. Kit Van Orman, Asst. To the Vice President and Treasurer, Wells College, PO Box 500, Aurora, NY 13026. Applications will be accepted until the position is filled. Wells College is an EEP Employer.

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Regional Education Manager, Japan & Asia Duties: Communicate regularly with representatives and customers in Japanese about company training/education programs and software products. Interface with all levels of management both inside and outside the company to implement solid business strategy. Track and influence objectives and forecasts for Japanese market. Work to integrate Japan with world-wide education programs. Travel to Japan and other Asian countries. Assist in developing formal business plans and product life cycles. Requirements: B.S. in either Japanese or C.S. related field. Must be fluent in Japanese and familiar with Japanese hardware/software and Japanese business customs. 2 years experience in Asian software development or localization. Salary: $60,000.00. Send resume to: Job Service, Attn: Pat Redington, Job Order #3060318, 140 East 300 South, SLC, Utah 84111.

SR. SOFTWARE ENGINEER Duties: Design and implement (CDS) Compound Document Services objects using database programming. Design and implement support for (NDS) NetWare Directory Services to run under Windows 95 and WindowsNT environments using C and (MFC) Microsoft Foundation Classes C++ programming and (VxD) Virtual Device driver internals programming. Develop advanced features using NDS. Develop functionalities and utilities based on NDS. Requirements: M.S. or equivalent in Computer Science related field plus three years programming NetWare modules experience or B.S. plus five years. Must know C, MFC C++, Windows 95 and WindowsNT and their internals, including VxD and database programming. Salary: $77,000.00/yr. Send resume to: Job Service, Attn: Pat Redington, Job Order #3060315, 140 East 300 South, SLC, Utah 84111.

Business Systems Analyst: For financial/accounting applications: Evaluate user request for new or modified computer program to determine feasibility, cost and time required, compatibility with current system, and computer capabilities; consult with users to identify current operating procedures and clarify program objectives; prepare flow charts and diagrams to illustrate sequence of steps program must follow and to describe logical operations involved; design and code structured programs, screens, and/or reports to accomplish goals of user requests; write documentation to describe program development, logic, coding and corrections; write manual for users to describe installation and operating procedures; assist users to solve operating problems; monitor performance of program after implementation. Requirements are: Master of Science degree in Computer Science or Information Systems. 40 hrs/week, 7:30 a.m to 4:30 p.m., $38,500 per year. Contact Office of Employment Security, 1991 Wooddale Boulevard, Baton Rouge, Louisiana 70806. Job Order Number 091072.

LAN Specialist: Maintain and support Novell LAN including LAN backup system; install mainframe, AS/400 and LAN cabling and LAN hubs; undertake special projects to improve LAN. Position requires bachelor's degree with major in Computer Information Systems or similar major and 6 mos. Prior experience as a LAN Specialist or LAN Technician. Prior experience must include LAN hub and cable installation experience. Must be Certified Novell Administrator (CNA). 40 hrs/wk; 8am-4:45pm; Salary of $28,000.00/yr. Send resume with Social Security No. To Indiana Dept. Of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46201-277, Attn: Gene R. Replogle. Include ID#3450376 with response. Applicants must be eligible for permanent employment in the United States.

SR. SOFTWARE ENGINEER Duties: Plan requirements, design, code and port functional component for use in GroupWise using ANSI C, C++, communication and messaging protocols. Design and implement Windows dialogs that allow GroupWise Administrators to configure and control GroupWise using Windows application programming and NetWare NLM programming. Work independently while coordinating with the team members who develop platform functions used by GroupWise. Requirements: B.S. in Computer Science related field, 5 years of designing messaging software. Must know communication and messaging protocols, ANSI C and C++ programming, Windows application programming, NetWare NLM programming and directory synchronization. Salary: $65,070.00. Send resume to: Job Service, Attn: Pat Redington, Job Order #3060319, 140 East 300 South, SLC, Utah 84111

LOCALIZATION ENGINEER II Duties: Localize NetWare products into traditional Chinese for DOS and Windows environments using networking protocols, C/C++. Test the Chinese version of the product in Chinese hardware/software test environment. Configure PC hardware/software for testing. Write test tools for a double byte Chinese environment. Solve double byte enabling problems. Format and recompile files for various platforms using C++. Ensure that localized user interface conforms to look and feel of standard version. Export and import files into database. Provide training and support to Translation and Documentation groups and third party vendors. Consult with engineers in Taiwan on testing problems. Report and fix bugs in Chinese version of NetWare products. Requirements: B.S. in C. S. related field. One year of traditional Chinese software, testing and programming experience. Must know NetWare and networking protocols, DOS, Windows, C/C++, PC hardware/software configuration, databases, Chinese double-byte enabling, Chinese software/hardware. Must be fluent in written, traditional Chinese and Mandarin. Salary: $44,503.00/yr. Send resume to: Job Service, Attn: Pat Redington, Job Order #3060321, 140 East 300 South, SLC, Utah 84111.

Go to the Careers section on Network World Fusion at this address.

http://www.nwfusion.com

Four past weeks of Networking Careers can be found under Job listing.

LOCALIZATION OUTSOURCING MANAGER Duties: Develop and manage relationships with third party localization vendors (Translators and Software testers). Assist in qualifying and certifying 3rd party vendors. Determine vendors knowledge and experience in NetWare, DOS, Windows and translation software, translation memory tools and desktop publishing software. Determine which aspects of a localization project can be outsourced and what level of support will be needed throughout the duration of the project. Select vendors for localization projects, including Help file compilation and testing. Prepare Statements of Work, summary of bids, status reports and final reports. Coordinate project bidding process evaluate bids. Schedule internal and external project activities. Track outsourcing costs, approve payment of invoices. Interface with internal localization production teams. Coordinate vendor training with internal localization production teams on software translation tools. Requirements: B.S. or equivalent in Translation or related field. 2 years project management of localization software/documentation. Must have working knowledge of NetWare and Windows, DOS operating systems. In depth knowledge of Help file compilation, software testing, software translation tools, translation memory tools, desktop publishing and project management software. Salary: $57,181.00. Send resume to: Job Service, Attn: Pat Redington, Job Order #3060316, 140 East 300 South, SLC, Utah 84111

LOCALIZATION ENGINEER II Duties: Localize NetWare products into Japanese for DOS, OS/2 and Windows environments using networking protocols, C/C++. Test Japanese version of the product in Japanese hardware/software testing environment. Configure PC hardware/software for testing. Write testing tools for a double byte Japanese environment. Solve double byte enabling problems. Format and recompile files for various platforms using C/C++. Ensure that localized user interface conforms to look and feel of standard version. Export and import files into database using UNIX, DOS, & Windows operating systems. Ensure the build environments for localization are enabled. Provide training and support to Translation and Documentation groups and third party vendors. Consult with engineers in Japan on testing problems. Report and fix bugs in Japanese version of NetWare products. Consult with other engineers in different groups on double byte language problems. Provide project management. Requirements: B.S. in Computer Science or related field. One year of programming and testing Japanese software. Must know NetWare and networking protocols, DOS, Windows, C/C++, UNIX, PC hardware/software configuration, databases, Japanese double byte enabling, Japanese software. Must be fluent in written, spoken Japanese. Salary: $44,503.00. Send resume to: Job Service, Attn: Pat Redington, Job Order #3060317, 140 East 300 South, SLC, Utah 84111.

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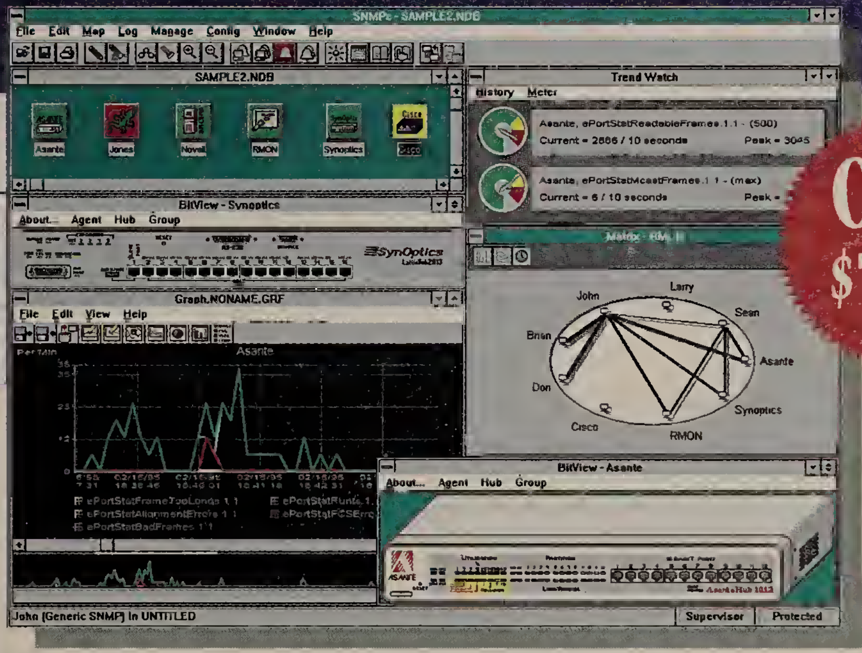

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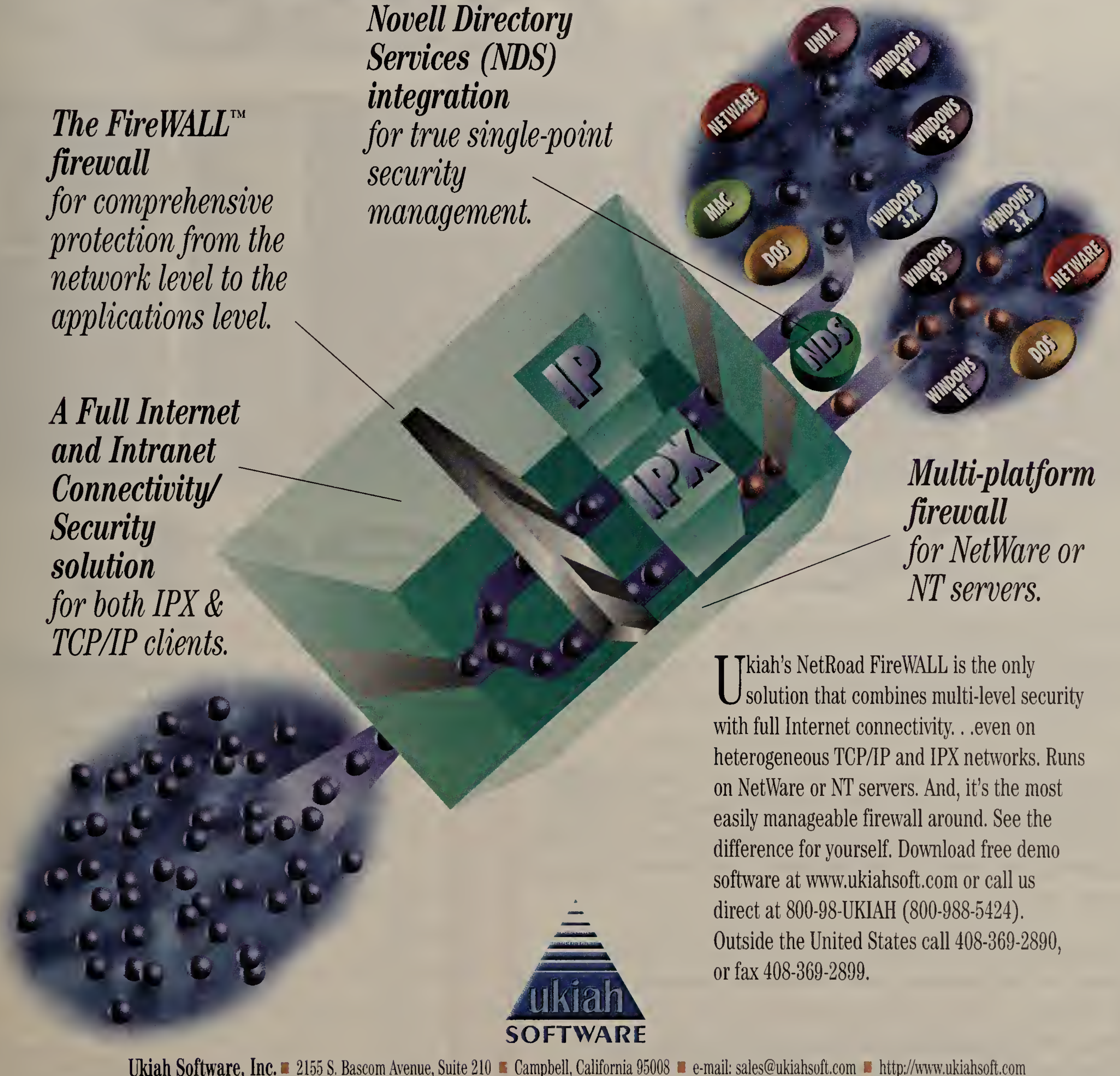

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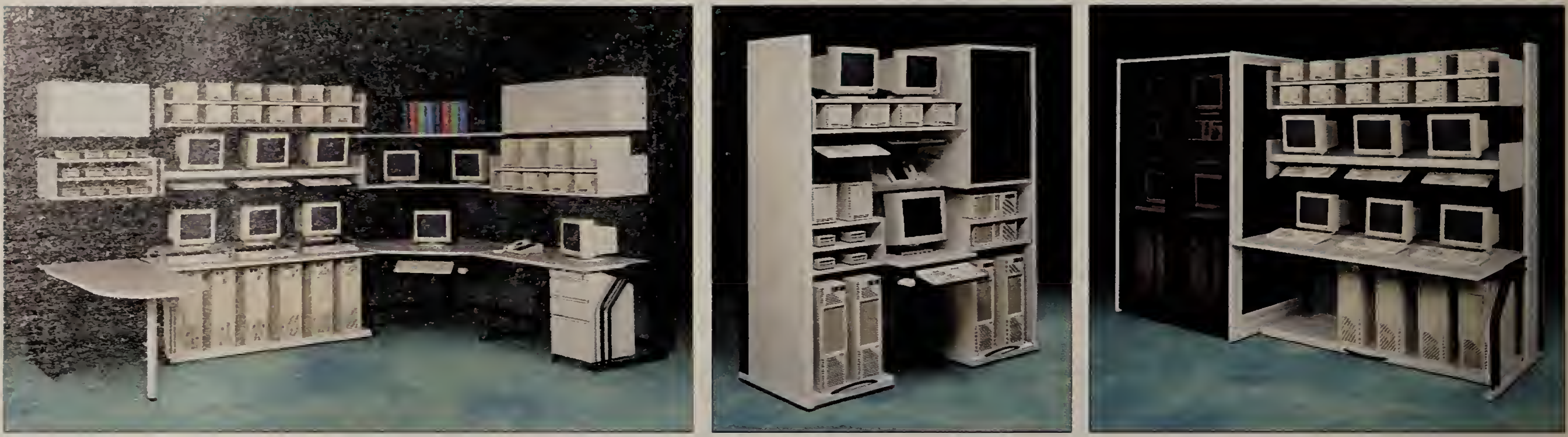

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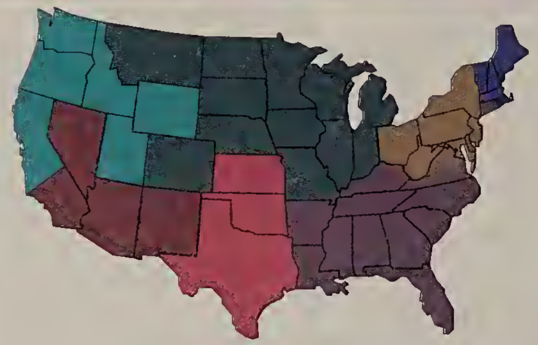

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Backspin

Fifty things that ruined my day: Agonies by the clock

09:00: I get into the office feeling awful (1). I worked until 5:00 in the morning (2) only to find that the problem with my Internet gateway I was trying to solve was due to a hardware problem (3), and not a *real* hardware problem (4) but a stupid the-card-just-doesn't-fit-quite-right problem (5).

Mark Gibbs

My head hurts. I sit down at my desk and start going through my E-mail. The first thing in my in-tray (6) is a spam (7). They tell me that I need a relaxation tape. Yeah, and don't I know it. We'll save that one in the bit bucket.

09:30: Another spam, or rather the PR equivalent there-of (8): Do I want to meet with the president of XYZ, Inc. (which I have never heard of) as it is about to launch its first product (9) that will free mankind from the tyranny and slavery of the computer, or some such. Nope. I ignore it.

10:30: I reply to several more messages and then Windows 95 (10) crashes (11). Rebooting (12) takes forever, probably because I'm hanging around watching it (13). I should have gone to get a cup of coffee (14).

> *I call their support group, which doesn't have an 800 number, and get put on the hold from hell myself.*

11:00: Fire up Word for Windows to write a product review. What's this? "WordBasic Err=124" (15). What's Err? Why do they have to contract the word "error"? Does saving two bytes make a difference? I guess given the bloated size (16) of Word these days, every little bit helps.

So, "Unknown Command, Subroutine, or Function" is the problem (17). That's it? That's supposed to tell me something? I hit Help, and nothing happens (18). Darn. I'm in a rush (because of last night), so I'll have to find out what's going on later, if I have time (19). Which I won't (20).

Right. We'll just push forward. Now I need to check something on a Web site, so I fire up Netscape Navigator, which — immediately — aborts (21).

Why? No idea. I've got 64% of system resources left (22), so it shouldn't be a memory problem (23). After all, I've got 32M bytes on the machine. Should have put in 64 (24). Or 128 (25).

Let's kill off as many apps (26) as possible (27) and try again (28). It's up! I knew I should have sacrificed some small mammal before work to appease the gods.

13:00: But wait. All is not well (29). No DNS entry (30)? Go over to the gateway machine (31) that also acts as my DNS server (32) and, lo and behold, it has frozen (33). Why? No idea (34). Restart it by hitting the reset button (35). Get back to work.

14:00: A phone call comes in (36). It's the same PR lackey (37) who sent me the idiotic invite (38) to meet with the company I'd never heard of (39). Instead of frying him on the spot, I put him on the hold from hell.

14:20: I go back to the computer. The product I'm reviewing won't run (40). I have read the documentation (41), which was apparently designed for brain-damaged chickens. I give up the pointless struggle, call their support group (42), which doesn't have an 800 number (43) and, after working through layers of idiots (44), get put on the hold from hell myself (45).

15:15: While I'm waiting, I go back to the PR lackey and ask him the most technical questions I can come up with and refuse to let him defer the answers until he can find someone who knows something. He thinks he's going to get a meeting out of this. Ha! "I'm really excited about this," I say. I put him back on hold.

16:15: I am still on hold to the vendor's tech support (46). Since an hour has gone by, I give up and send the vendor's president (47) the following message: "I would have reviewed your product, but your support stinks and deadlines prevent me from taking this review any further." The entire network crashes (48).

18:00: The network (49) is back up and running. I need sleep.

23:00: I am still up, unable to sleep. I wonder if the PR guy is still on hold. Tomorrow's another day (50).

How was your day? Send sob stories by E-mail (nwcolumn@gibbs.com) or use Mr. Bell's infernal device to get me at (800) 622-1108, Ext. 504.

'NET BUZZ

The latest on the Internet/intranet Industry.

By Chris Nerney

RUMORS OF THEIR DEMISE HAVE BEEN GREATLY EXAGGERATED They were written off for dead, mocked and paraded about by torch-carrying cybervillagers as an example of everything that was wrong with the Internet Gold Rush of 1996.

Now, quietly and steadily, a trio of Internet search engine stocks have climbed from the seeming edge of oblivion in the latter half of '96 to prices higher than their initial public offerings (IPO) last April.

Lycos, Inc., first out of the gate on April 1, is now trading closer to its 1996 high price than the $5.75 investors were paying after the Internet IPO market dropped dramatically in July (see graphic).

ON THE COMEBACK TRAIL

Search engine stocks rebound from '96 Internet IPO bubble

	Date IPO issued	Offer price	1996 low	1996 high	Feb. 20 close
Excite	April 3	$17	$5.00	$21.25	$17.00
Lycos	April 1	$16	$5.75	$29.25	$20.88
Yahoo	April 12	$13	$15.50	$43.00	$31.88

Same thing with **Excite, Inc.**, which has been trading near its April offer price, and **Yahoo, Inc.**, now at about two-and-one-half times its $13 debut.

Don Gooding, a research partner at venture capital firm **Accel Partners**, calls the resurgence of search engine stock prices "significant."

He says, "There will be some winners in the search engine business because advertising is providing a source of revenue for the very top tier of search engine companies."

None of which means these compnies are out of the woods yet. Excite and Lycos continue to lose money, and Yahoo barely showed a profit last quarter. But for now, at least, investors in these three companies can hold out some kind of hope – false or not.

BATTER THEM WITH VENTURE CAPITAL **Battery Ventures** has announced a $3 million venture funding deal with **Inventa Corp.**, a firm that helps corporations develop and implement intranet business applications and Internet-enabled networks.

Todd Dagres, a general partner with Battery Ventures, says it is the first round of venture capital financing for the Santa Clara, Calif.-based Investa, which was founded in 1992 by **Ashok Santhanam**, formerly of Gould, Inc. Investa clients include **PeopleSoft, Inc., Netscape Communications Corp.** and the **Los Angeles Times** Web site.

CASH FLOWS TO CACHEFLOW **CacheFlow, Inc.** has secured $5.1 million in venture capital from a group of investors led by **Benchmark Capital** of Menlo Park, Calif.

Based in Redmond, Wash., CacheFlow develops Web caching devices designed to improve Web site performance and provide faster Internet access.

It's the first round of venture financing for the company, which was founded in March 1996. Company founders include **Joe Pruskowski**, formerly of **Emulex Corp.; Doug Crow**, formerly of **Wall Data, Inc.;** and **Michael Malcolm**, former president and CEO of **Network Appliance, Inc.**

WHATEVER HAPPENED TO THE PHONE? Usually companies don't like too much "chat" going on in the workplace, but start-up **eShare Technologies, Inc.** apparently thinks more chat is better business.

The company, formerly **Interactive Marketing Technologies,** today is releasing Expressions, Java-powered chat software for corporate intranets and Web sites. Officials of the Hauppauge, N.Y.-based company say Expressions allows corporate users to create chat rooms for customer service, technical support, sales and other business functions.

Here's where it gets heartwarming. The company promises Expressions will "harness the universal reach of the Web to create enduring bonds and improve relationships" with customers and employees.

Expressions costs $795 for a 100-user license – pretty cheap for "enduring bonds," if you ask us.

'Net Buzz doesn't do chat rooms, so if you have some hot Internet and intranet news items, contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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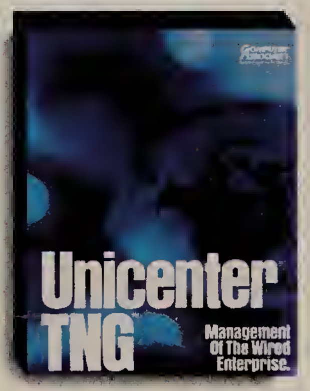

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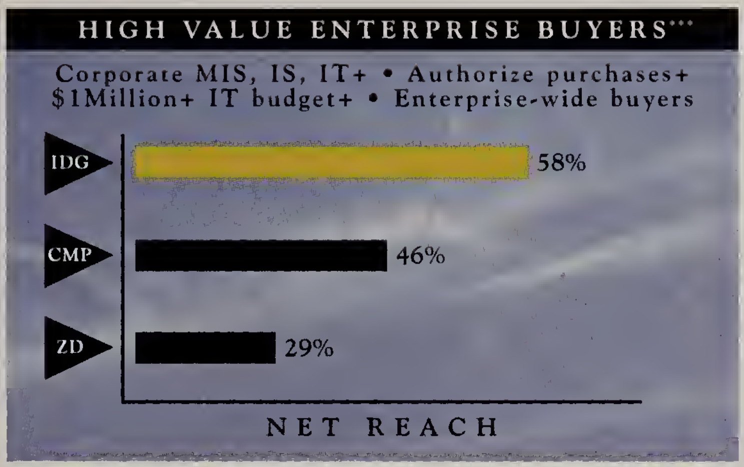

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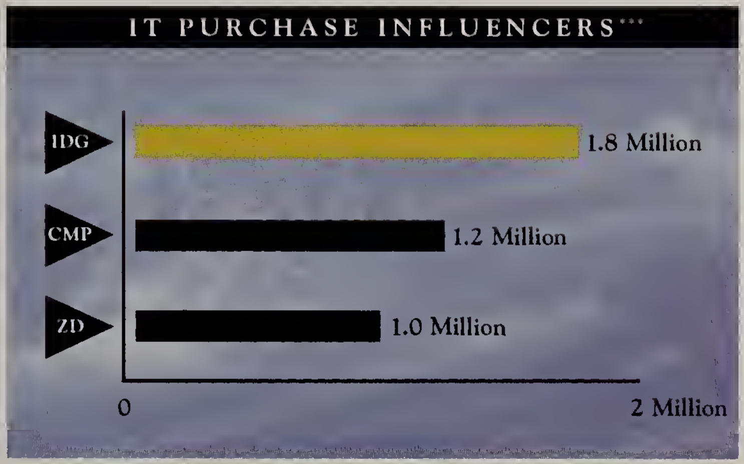

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[**]Source: IDG Corporate Database and CIMS v3.0 IntelliQuest *[***]Source: CIMS v3.0 IntelliQuest; IDG=1x CW, IFW, NWW; CMP=1x IW, CWK, NC; ZD=1x PCW*

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